A STUDY ON QUALITY OF LIFE IN COMPARISON BETWEEN SURGERY AND RADIOTHERAPY FOR ORAL CARCINOMA

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

In partial fulfilment of regulations for award of the degree of

MASTER OF SURGERY (GENERAL SURGERY)

BRANCH I: M.S (GENERAL SURGERY)

DEPARTMENT OF GENERAL SURGERY

GOVERNMENT STANLEY MEDICAL COLLEGE AND HOSPITAL

THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY

CHENNAI

APRIL 2017

CERTIFICATE

This is to certify that the dissertation titled **"QUALITY OF LIFE IN COMPARISON BETWEEN SURGERY AND RADIOTHERAPY FOR ORAL CARCINOMA"** is the bonafide work done **by Dr.S.BALAJI PRASAD,** Post Graduate student (2014 – 2017) in the Department of General Surgery, Government Stanley Medical College and Hospital, Chennai under my direct guidance and supervision, in partial fulfillment of the regulations of The Tamil Nadu Dr. M.G.R Medical University, Chennai for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in April 2017.

Prof. DR.G.V.MANOHARAN M.S.,
Professor of Surgery,
Dept. of General Surgery,
Stanley Medical College,
Chennai-600001.

Prof.DR.D.NAGARAJAN M.S.
Professor & Head of the Department,
Dept. of General Surgery,
Stanley Medical College,
Chennai-600001.

PROF. DR.ISAAC CHRISTIAN MOSES M.D., FICP., FACP.,
The DEAN
Stanley Medical College,
Chennai-600001.

DECLARATION

I**, DR.S.BALAJI PRASAD** solemnly declare that this dissertation titled **"QUALITY OF LIFE IN COMPARISON BETWEEN SURGERY AND RADIOTHERAPY FOR ORAL CARCINOMA"** is a bonafide work done by me in the Department of General Surgery,Government Stanley Medical College and Hospital, Chennai under the guidance and supervision of my unit chief.

Prof. DR.G.V.MANOHARAN M.S.,
Professor of Surgery

This dissertation is submitted to The Tamilnadu Dr.M.G.R. Medical University, Chennai in partial fulfillment of the University regulations for the award of M.S., Degree (General Surgery) Branch - I, Examination to be held in April 2017

Place: Chennai.

Date: September 2016 **DR.S.BALAJI PRASAD**

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INSTITUTIONAL ETHICAL COMMITTEE, STANLEY MEDICAL COLLEGE, CHENNAI-1

Title of the Work : Quality of life in Comparison between surgery and Radiotherapy for oral carcinoma – A Prospective Study.

Principal Investigator : Dr. S. Balaji Prasad

Desigoation : PG MS (General Surgery)
Department : Department of General Surgery,
Government Stanley Medical College,
Chennai-01

The request for an approval from the Institutional Ethical Committee (IEC) was considered on the IEC meeting held on 14.06.2016 at the Council Hall, Stanley Medical College, Chennai-1 at 2PM

The members of the Committee, the secretary and the Chairman are pleased to approve the proposed work mentioned above, submitted by the principal investigator.

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MEMBER SECRETARY
ETHICAL COMMITTEE,
STANLEY MEDICAL COLLEGE
CHENNAI-600 001.

INTRODUCTION

EPIDEMIOLOGY OF HEAD AND NECK CANCER

The estimated number of new head and neck cancer cases (excluding skin cancer) in the United States in 2009 was 48,010; this represents 3 . 2 % of the total new cancer cases. Approximately 2 7 % of these patients are women. African Americans have a higher age-adjusted incidence than other ethnic groups. The usual time of diagnosis is after the age of 40, except for salivary gland and nasopharyngeal cancers (NPCs), which may occur in younger age groups. .tobacco and alcohol are important risk factors and has a synergetic effect. Head and neck cancer patients have an increased risk for developing a second primary tumor (SPT) , both within the head and neck and elsewhere (e.g.,

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INTRODUCTION

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INCIDENCE

The occurrence of oral carcinoma has increased in past few years and mainly among females. This is due to the alcohol intake and smoking. In western countries the recent culture of binge drinking and smoking has increased the incidence rate by many folds.

AIMS & OBJECTIVES

Though there has been many advancements in treatment and diagnostic techniques, in detecting carcinomas, there has been not much about the quality of life of assessement of cancer patients.Many studies concentrate on the treatment and prognosis forgetting the fact of quality of life.This study is to assess the quality of life of oral carcinoma patients who underwent surgery or radiotherapy and to weigh their importance accordingly.

METHODOLOGY

50 oral cancer patients who underwent surgery (25 patients) and RT (25patients) in Stanley medical college for stage 1 and stage 2 lesions of oral carcinoma for past 3 Years (2013-2015) will be enrolled. Their quality of life assessment will be done using The WHO adopted INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) QUESTIONNAIRE.The ICF comprises of 4 sections. They are

SECTION 1: Comprises of PROBLEMS WITH PARTS OF THE BODY.

SECTION 2: Comprises of PROBLEMS WITH ACTIVITY AND SOCIAL FUNCTIONING.

SECTION 3: Deals with PROBLEMS WITH THE ENVIRONMENT.

SECTION 4: Deals with GENERAL STATE OF HEALTH.

PLACE OF STUDY: DEPARTMENT OF GENERAL SURGERY,

STANLEY MEDICAL COLLEGE AND HOSPITAL

DURATION: JANUARY 2016 TO SEPTEMBER 2016

STUDY DESIGN PROSPECTIVE STUDY

SAMPLE SIZE : 40

INCLUSION CRITERIA:

1) Patients who underwent surgery or radiotherapy for stage1 and stage 2

2) oral carcinoma in Stanley medical college

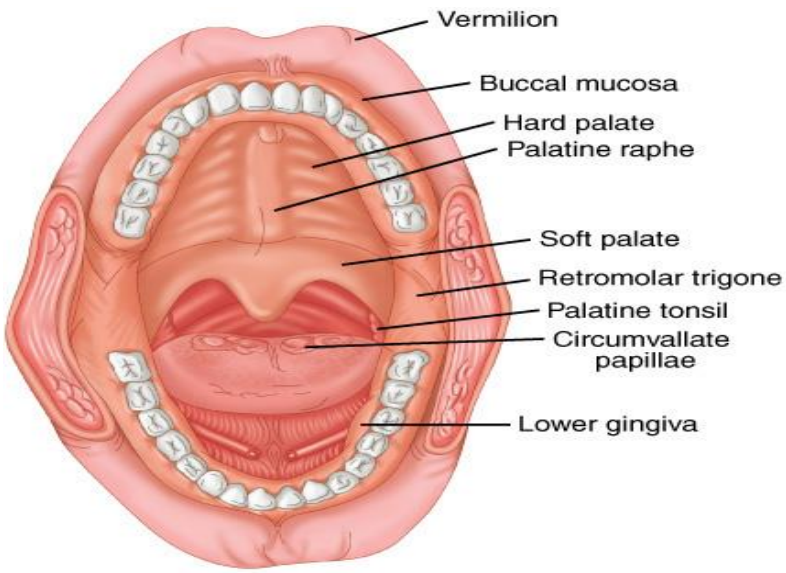
EXCLUSION CRITERIA:

1) Patients with oral carcinoma of stage 3 and stage 4

ANATOMY

Lip and oral cavity

The oral cavity starts from the vermilion border of the lip to the hard- palate/soft-palate junction superiorly, to circumvallate papillae inferiorly, and to the anterior tonsillar pillars laterally. Advanced oral cavity lesions may present with mandibular and/or maxillary involvement requiring special consideration at the time of resection and reconstruction. Regional metastatic spread of lesions of the oral cavity is to the lymphatics of the submandibular and the upper jugular region (levels I, II, and III).



PATHOLOGY

The oral cavity has complex anatomy.

The nerves, blood vessels, lymphatic pathways and fascial planes aid in the spread of disease.every fascial plane including the periosteum is barrier to tumor spread but it aids in lymph node spread.

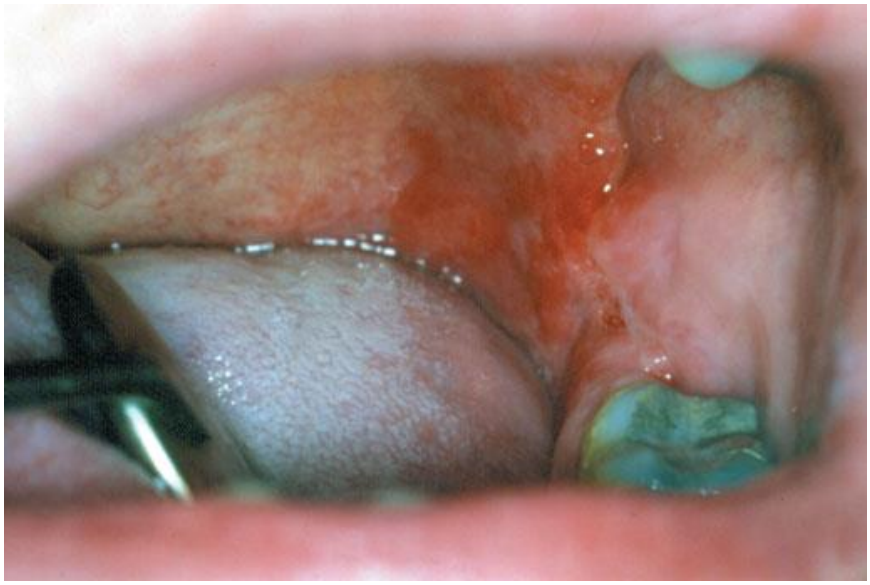
Tumor spread through nerves and it decides the prognosis.Blood vessel involvement also plays role in prognosis and mainly of tongue cancer.

Histology

Squamous cell carcinoma is the most common form of histological pattern in oral carcinoma,but there can also be presence of minor salivary glands tumor and melanomas have been reported.The occurrence of lymphomas are also not uncommon and its predominance in waldeyers ring has been reported.

PRE-MALIGNANT LESIONS

LEUCOPLAKIA



ERYTHROPLAKIA

Premalignant conditions of oral cavity

1. Leukoplakia
2. Erythroplakia
3. Chronic hyperplastic candidiasis
4. Oral submucosal fibrosis
5. Syphilitic glossitis
6. Sideropenic dysphagia
7. Oral lichen planus

Clinical features

Leucoplakia

Leucoplakia is a white patch or plaque. It has no histological correlation. It varies from a small, well-circumscribed, homogenous white plaque to an extensive lesion involving large surface areas of the oral mucosa. It may be smooth or wrinkled, fissured and can be in any colour depending on the thickness of the lesion.

Speckled leucoplakia

Type of leukoplakia which hashigh rate of malignant transformation. It arises from a erythematous lesion.

ERYTHROPLAKIA

- It is red velvety appearance of the mucosa which cannot characterise any recognised condition.
- It is 17-20 times more potentially malignant than leukoplakia.
- Histologically parakeratosis with severe epithelial dysplasia is the typical feature.
- Red color is due to decreased keratin causing shining and prominence of submucosal red vascularised connective tissue.
- It is equal in both sexes.
- It is common in lower alveolar mucosa, gingivo buccal sulcus and floor of the mouth.
- It can be homogenous/speckled/ granular or erythroplakia interspersed with leukoplakia.
- Diagnosis is done by biopsy. Treatment: Biopsy and surgical excision.

PRE-MALIGNANT CONDITIONS

Chronic hyperplastic candidiasis

Chronic hyperplastic candidiasis causes dense plaques of leucoplakia, mainly around the commissures of the mouth. The lesions extend on to the vermilion and even the facial skin. These lesions have a high incidence of malignant transformation, thought to be the due to invasion of the lesion by Candida albicans. Few of patients have an associated immunological defect, which encourages the invasion of C. albicans, making the patient susceptible to malignant transformation. Specific management of chronic hyperplastic candidiasis is prolonged (6 weeks) topical anti-fungal treatment or systemic anti-fungal treatment (2 weeks). If the lesion exists even after medical therapy, surgical excision or laser vaporisation is done.

CHRONIC HYPERPLASTIC CANDIDIASIS

Oral submucous fibrosis

Submucosal Fibrosis

- Due to

  – Prolonged local irritation by chilies, tobacco (pan/quid), areca due to arecoline

  – Dietary causes— deficiencies of vitamin A, B complex (riboflavin) and iron

  – Localised collagen disorder

- Racial – It is common among Indians / Asians and people of Indian origin

- Prevalence in India is 5 per 1000

- Incidence is 4-7 %

- Common in middle age; equal in both sexes

- Soreness and burning in mouth which is more during meals; vesicular eruptions; trismus; difficulty in protruding the tongue. Initial red area turns into superficial ulcers which later forms stiff, fibrotic bands and scarring.

- Common in soft palate, faucial pillars; buccal mucosa
- Disease is progressive
- It shows epithelial atrophy, hyperplasia, dysplasia and fibrosis
- Treatment – local injection of dexamethasone (4 mg) with hyalase (1500 units) biweekly for 10 weeks; avoidance of irritants; vitamin supplements; correction of anaemia; surgical wide excision and skin grafting.

ORAL SUBMUCOUS FIBROSIS

CLASSIFICATION AND STAGING ORAL CARCINOMA

TNM staging

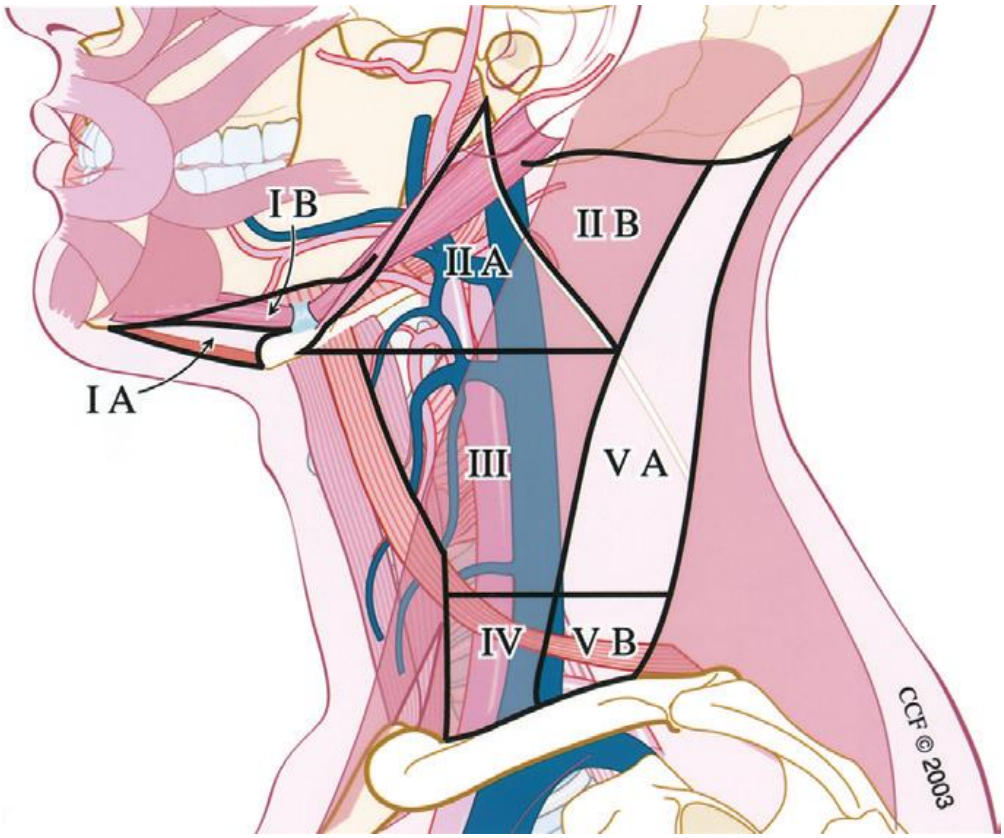
Staging of head and neck cancer is defined by the American Joint Committee on Cancer (AJCC) and follows the TNM system. .CT AND MRI are also taken in count. The T classification indicates the extent of the Primary tumour and the N classification relates to the extent of regional neck metastases to the cervical lymph nodes; this is identical for all mucosal sites of the head and neck except for the nasopharynx.

The M classification relates to distant metastasis.The nodal status decides the risk of distant metastasis rather than the tumor size.

Patterns of lymph node metastasis

The lymph nodes in cervical region are represented In the figure below Tumor in oral cavity spread to lymph nodes at levels I, II and III. Oral tongue has a nature to cause skip metastasis to level III and IV without involving higher levels.oropharynx spreads to lymph node levels II, III and IV, as well as retropharyngeal and contralateral nodal groups.

PATTERNS OF LYMPH NODE METASTASIS



TX Primary tumor cannot be assessed

TO No evidence of primary tumor

Tis Carcinoma in situ

T1 Tumor 2 cm or less in greatest dimension

T2 Tumor more than 2 cm but no more than 4 cm in greatest dimension

T3 Tumor more than 4 cm in greatest dimension

T4a (Lip-vermillion border) Tumor invades through cortical bone, inferior alveolar nerve, floor of mouth, or skin of face (i.e., chin or nose)

T4a (Oral cavity) Tumor invades adj acent structures (e.g., through cortical bone, into deep [extrinsic] muscle of tongue [genioglossus, hyoglossus, palatoglossus, and styloglossus] , maxillary sinus, skin of face)

T4b Tumor invades masticator space, pterygoid plates, or skull base and/or encases internal carotid artery.

NX Regional lymph nodes cannot be assessed

NO No regional lymph node metastasis

Nl Metastasis in a single ipsilateral lymph node, 3 cm or less in greatest dimension

N2 Metastasis in single ipsilateral lymph node, more than 3 cm but no more than 6 cm in greatest dimension; or in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension; or in bilateral or contralateral lymph nodes, no more than 6 cm in greatest dimension

N2a Metastasis in single ipsilateral lymph node, more than 3 cm but no more than 6 cm in greatest dimension

N2b Metastasis in multiple ipsilateral lymph nodes, none more than 6 cm in greatest dimension

N2c Metastasis in bilateral or contralateral lymph nodes, none more than 6 cm in greatest dimension

N3 Metastasis in a lymph node more than 6 cm in greatest dimension

M0 NO METASTASIS

M1 DISTANT METASTASIS

INVESTIGATIONS

1. Edge biopsy, usually taken from two sites. Biopsy has to be taken from the edge as it contains active cells; not from the centre as it is the area of necrosis. Malignant squamous cells with epithelial pearls (Keratin pearls) are the histological features.

Note: Biopsy from the centre is taken only from postradiotherapy ulcer and ulcerated minor salivary gland tumours.

Broder‘s histological grading:

a. Well-differentiated: > 75% epithelial pearls

b. Moderately differentiated: 50-75% epithelial pearls

c. Poorly differentiated: 25-50% epithelial pearls

d. Very poorly differentiated: < 25% epithelial pearls

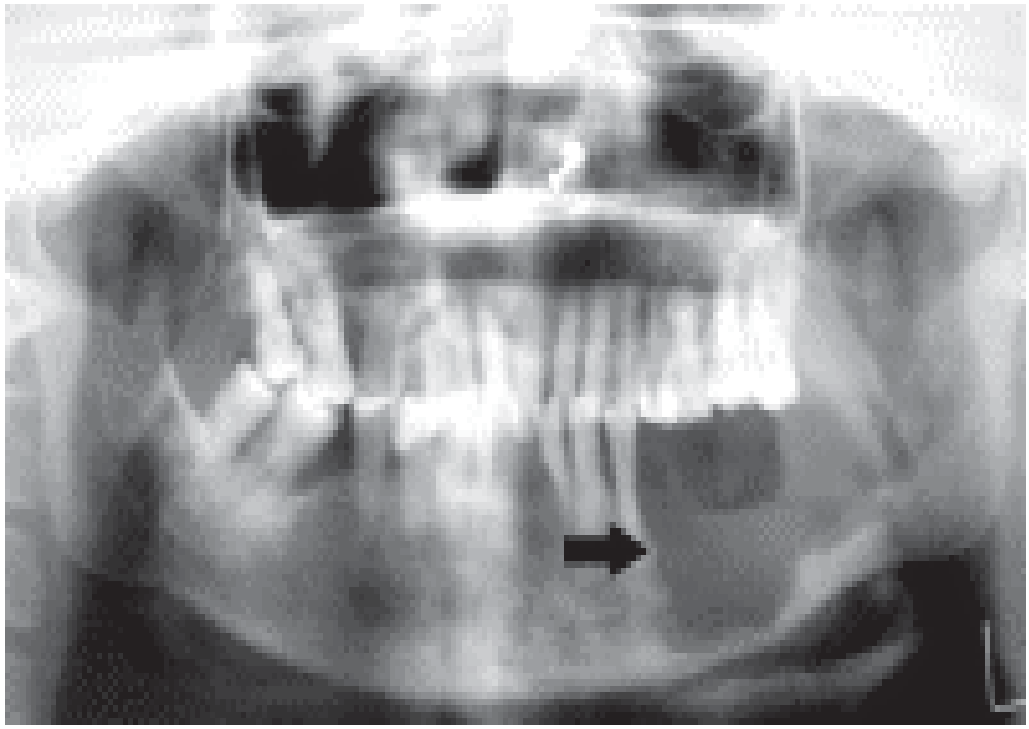
2 FNAC from lymph nodes.

3. CT scan—to assess the extension of tumour and its secondaries.

4. Orthopantomogram to look for the involvement of mandible—destruction and fracture sites.

NORMAL ORTHOPANTOMOGRAM

SHOWING INFILTRATION



ORAL CAVITY

The oral cavity consists of the lips, floor of mouth, anterior two-thirds of the tongue, buccal mucosa, upper and lower alveolar ridges, hard palate, and retromolar trigone.

LIP:

The ratio between men and women with lip cancer is Approximately 1 5 : 1 .217 Persons with light-colored skin and/or More exposure to sunlight are most prone to develop lip carcinoma.

Anatomy

The lips are composed of the orbicularis oris muscle with skin on the external surface and mucous membrane on the internal surface. The transition from skin to mucous membrane is the lip vermilion. The blood supply is from the labial artery, a branch of the facial artery. The motor nerves are branches of the seventh cranial nerve. The sensory nerve to the upper lip is the infraorbital branch of the fifth cranial nerve (V 2) , and the mental nerve (V 3) supplies the lower lip.

Pathology

The most common neoplasms are SCCs. Basal cell carcinomas start on the skin of the lip and may secondarily invade the vermilion. Keratoacanthoma occurs on the skin of the lips and may be mistaken grossly and histologically for scc. Leukoplakia and CIS are common problems on the lower lip and may precede the appearance of carcinoma by many years.

Patterns of Spread

SCC can arise from the skin of the lip or the vermilion, which may invade the adjacent skin and orbicularis muscle. Advanced lesions invade the adjacent commissures of the lip, the buccal mucosa, the skin and wet mucosa of the lip, the adjacent mandible, and eventually the mental nerve. PNI occurred in 2% of the cases reported by Byers et al. and was related to recurrent lesions, large tumor size, mandibular invasion, and poorly differentiated histology. Lymphatic spread is to the submental (IA) and submandibular (IB) lymph nodes and then to the jugular chain. The risk for lymph node metastases is approximately 5 % at diagnosis and is increased by high-grade histology, large lesions, invasion of the mucosa of the lip and buccal, and for patients with recurrent disease.

Clinical Picture

The vermilion of the lower lip is the most common site of origin. scc may present as an enlarging discrete lesion that is not tender until it ulcerates. Some lesions develop slowly on a background of leukoplakia or CIS and present as superficially ulcerated lesions with little or no bulk. Erythema of the adjacent skin suggests dermal lymphatic invasion. Palpation of the lip will reveal the extent of induration. Paresthesia of the skin of the lip indicates PNI.

Treatment

Selection of Treatment Modality Early lesions may be cured equally well with surgery or RT. The length of the relaxed lower lip is approximately 7 cm but tends to be shorter in edentulous patients. Surgical excision is preferred for the majority of lower lip lesions up to 2 cm in diameter that do not involve the commissure; the treatment is Simple and the cosmetic result is satisfactory. Removal of more of the lip with simple closure usually results in a poor cosmetic and functional result and therefore requires reconstructive procedures. RT is often preferred for lesions involving the commissure, for lesions over 2 cm in length, and for upper lip carcinomas. Advanced lesions with bone, nerve, or node involvement frequently require a combined modality approach.

The regional lymphatics are not treated electively for early cases. Advanced lesions, high-grade lesions, and recurrent lesions should be considered for elective neck treatment.

Surgical Treatment

Surgical treatment for early lesions (0.5-1.5 cm) uses a V- or W-shaped excision, depending on the size of the defect, which facilitates cosmetic primary closure. If the vermilion is diffusely involved with little or no involvement of the muscle, a vermilionectomy may be performed and the mucosa from the labial vestibule of the oral cavity advanced to cover the defect.

Irradiation Technique

Lip cancer may be successfully treated by EBRT, interstitial brachytherapy, or a combination of both. Interstitial brachytherapy may be accomplished with removable sources such as iridium- 1 92 . EBRT techniques use orthovoltage (5 5 . 8 Gy at 1 . 8 Gy per fraction) or electrons (60-66 Gy at 2 Gy per fraction) with lead shields behind the lip to limit exit EBRT. IMRT is not indicated except for the occasional patient with Advanced neck disease and/or clinical PNI, when it is necessary to Extend the dose distribution to the skull base and reduce the

dose to the contralated parotid. For more advanced lesions, combining chemotherapy with EBRT is appropriately considered.

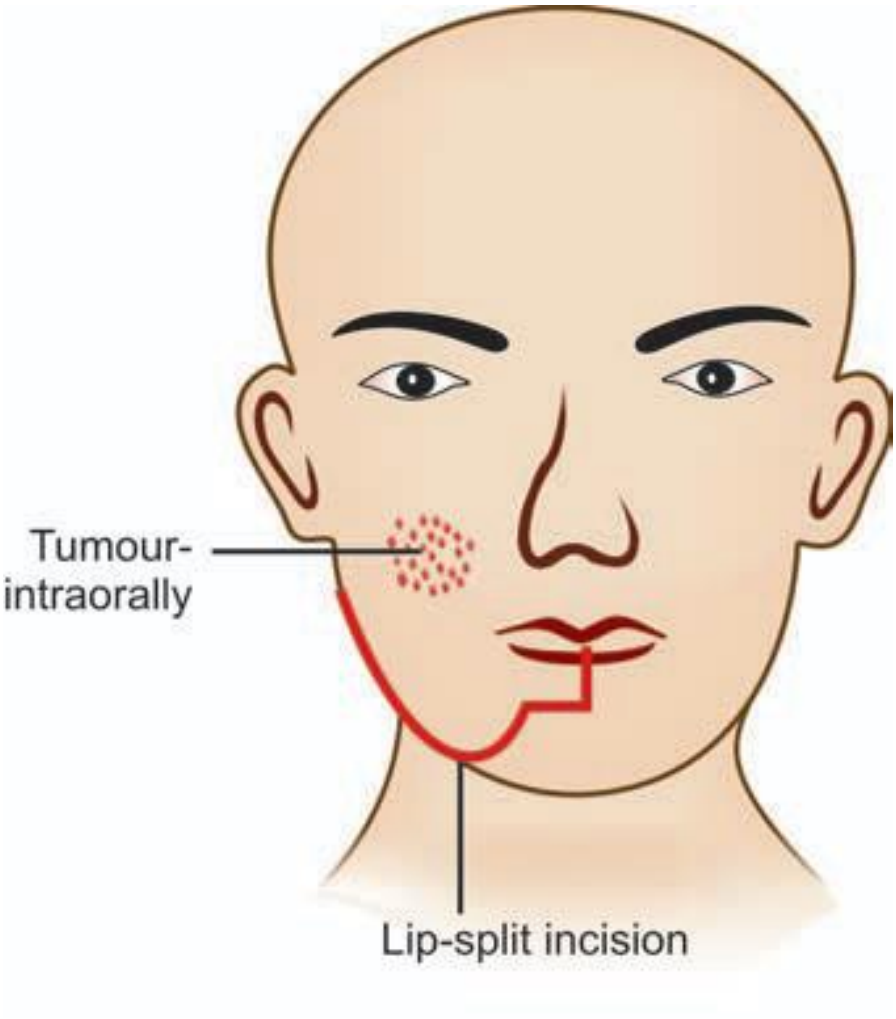
Results of Treatment

MacKay and Sellers reviewed 2 , 8 64 patients with all stages of lip cancer, of whom 92% were managed initially by R T. The primary lesion was controlled by the initial treatment in 8 4 % of cases; an additional 8% were salvaged by later treatment for an overall local control rate of 92% . Fifty-eight percent of those who presented with clinically involved nodes had control of disease, but only 35% had control of disease when neck nodes appeared later. The 5 -year cause-specific survival rate was 89% ; the 5-year absolute survival rate was 65 %. Mohs and Snow reported the results for 1 ,448 patients treated with microscopically controlled surgery for scc of the lower lip between 1936 and 1976. Eighty-three percent had cancers less than 3 cm in diameter, with a 5-year cure rate of 9 6 . 6 % . For 1 92 patients with cancers that measured 2 cm or more, the cure rate dropped to 60 % . For patients with grade 1 or 2 scc, the 5-year cure rate was 9 6 % , as contrasted with 67% for 81 patients with grade 3 or 4 sec.

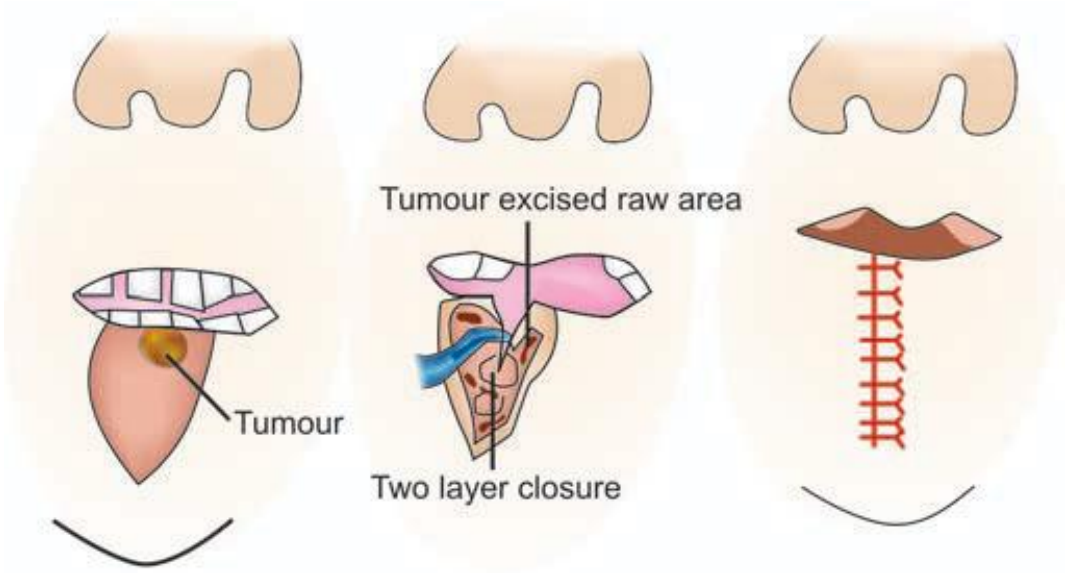
Complications of Treatment

Oral competence, which permits patients to control oral secretions and effectively suck, speak, and swallow, requires the sphincteric function of an intact orbicularis oris muscle. Hence, disruption of the sphincteric function resulting from division of the orbicularis oris should be restored. Microstomia and drooling secondary to oral incompetence may occur after a large flap reconstruction. If the oral opening is too small, the patient may not be able to inset a denture. There will be some atrophy of the irradiated tissues; this progresses with time. Soft tissue necrosis may occur; this problem is reduced by schemes that prolong the treatment.

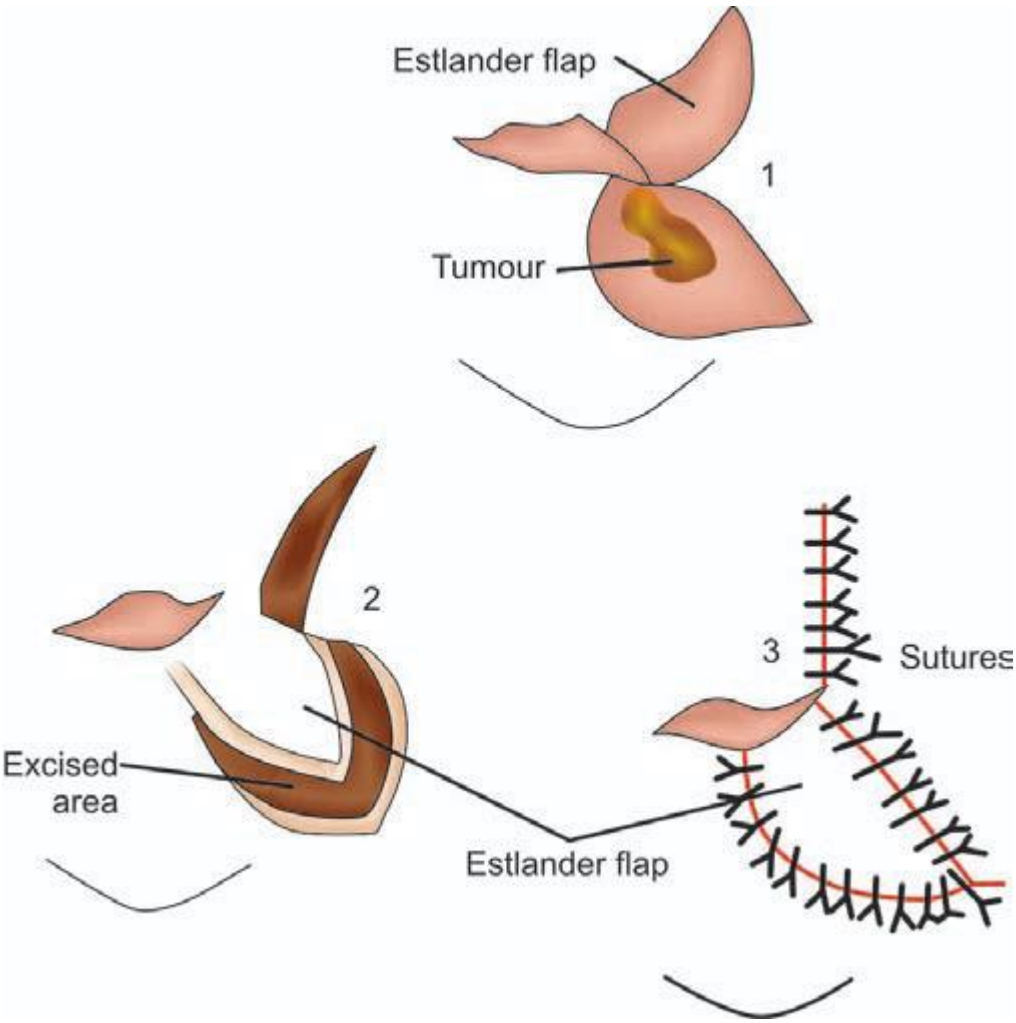
LIP-SPLIT INCISION



PRIMARY REPAIR OF LIP



UPPER LIP BASED FLAP FOR LOWER LIP CARCINOMA



FLOOR OF THE MOUTH

Anatomy

The floor of the mouth is a U-shaped area bounded by the lower gum and the oral tongue; it terminates posteriorly at the insertion of the anterior tonsillar pillar into the tongue. The paired sublingual glands lie immediately below the mucous membrane; the paired genioglossus and geniohyoid muscles separate them.

Bony protuberances, the genial tubercles, occur at the point of insertion of these two muscle groups at the symphysis and may interfere with the placement of interstitial sources. The mylohyoid muscle arises from the mylohyoid ridge of the mandible and is the muscular floor for the oral cavity; it ends posteriorly at about the level of the third molars . The submandibular gland rests on the external surface of the mylohyoid muscle between the mandible and the insertion of the mylohyoid. The submandibular duct (Wharton's duct) is about 5 cm long. It courses between the sublingual gland and the genioglossus muscle and exits in the anterior floor of the mouth near the midline.

Pathology

Most neoplasms are SCC, usually of moderate grade. Adenoid cystic and mucoepidermoid carcinomas account for about 5 % of malignant tumors in this area.

Patterns of Spread

Primary

Approximately 9 0 % of neoplasms originate within 2 cm of the anterior midline floor of the mouth, penetrating early beneath the mucosa into the sublingual gland and eventually into the genioglossus and geniohyoid muscles. The mylohyoid muscle acts as an effective barrier until the lesion becomes advanced. Extension toward the gingiva and periosteum of the mandible occurs early. When tumor reaches the periosteum, the tumor usually spreads along the periosteum rather than through it.

Mandible invasion is a late manifestation. The skin of the lower lip may be involved in advanced cases. Posterior extension occurs into the muscles of the root of the tongue. One or both submandibular ducts are frequently obstructed by tumor or after biopsy; it may be difficult to distinguish between tumor extension and infection in an obstructed duct.

Tumor rarely grows inside the duct but may grow along the path of the duct. The submandibular gland frequently enlarges, becoming firm and occasionally painful when the duct is obstructed. CT is useful to distinguish between tumor directly invading the gland and chronic infection related to obstruction.

Extensive lesions may escape the oral cavity by following the anatomic plane of the mylohyoid muscle to its posterior extremity, emerging in the submandibular space of the neck.

Lymphatics:

Approximately 3 0 % of patients will have clinically positive nodes on admission; 4% will have bilateral nodes. The reported incidence of conversion from NO to N + with no neck treatment varies from 20% to 3 5 % .For T1 or superficial T2 lesions, the risk for occult metastasis is probably 1 0 % to 1 5 % . The first nodes involved are the level I and the level II nodes; the midline submental nodes are bypassed. Because most lesions either approach or cross the midline, the risk for bilateral spread is fairly high. Clinical Picture On physica examination, the earliest lesions appear as a red area, slightly elevated, with ill-defined borders and very little induration. As the lesion enlarges, the edges of the tumor become

distinct, elevated, and "rolled," with a central ulceration and induration. Some lesions start with a background of leukoplakia.

Bimanual palpation will determine the extent of the induration and the degree of fixation to the periosteum. Large lesions bulge into the submental space and rarely grow through the mylohyoid muscle into the soft tissues of the neck. Gross invasion of the mandible may be detected, especially when the anterior teeth have been removed. A tumor may grow through the mandible to involve the gingivolabial sulcus and lip. The submandibular duct and gland are evaluated by bimanual palpation.

Treatment

Selection of Treatment Modality

Early Lesions.

Surgery or RT is equally effective treatment for T1 or T2 lesions. Most patients are treated surgically because of the risk of soft tissue or bone necrosis after RT. A few patients are seen after excisional biopsy of a tiny lesion, and the only finding is a surgical scar with varying degrees of induration or nodularity under the scar (TX). The margins are often equivocal. These patients are sometimes treated with an interstitial implant or, more commonly, re-excision.

Moderately Advanced Lesions. The usual recommendation for moderately advanced anterior midline lesions is rim resection or segmental mandibulectomy & steomyocutaneous free flap reconstruction; postoperative RT is added, with the addition of concurrent chemotherapy in some cases, as dictated by the findings in the specimen. The clinically NO neck is usually managed by a bilateral functional neck dissection for midline lesions.

Advanced Lesions.

Massive lesions have a poor prognosis with combined surgery, RT, with or without chemotherapy. Only palliation can be offered in some cases. Surgical Treatment Wide Local Excision. Small lesions (< 5 mm in size) may be excised transorally with a 1 -cm margin with primary closure or a skin graft. If the duct is involved, the submandibular gland and duct are removed in continuity.

Rim Resection.

Rim resection of the mandible in continuity with excision of the primary lesion preserves the arch and may be combined with postoperative RT. Periosteal invasion is often an indication for this procedure. Patients who have been edentulous for a long time may have

an atrophic mandible and are not suitable because the mandible is likely to fracture.

Segmental Mandibulectomy.

Lateral floor of mouth: a modified neck dissection is performed and the specimen remains attached to the mandible. Partial segmental mandibulectomy with resection of the floor of the mouth is done through a lipsplitting incision or by using a visor flap. A cheek flap is elevated to the level of the mandibular condyle to provide exposure. The mandible is separated at the mental foramen anteriorly and the neck of the condyle posteriorly. The primary lesion and neck specimen are then removed in continuity. An osteomyocutaneous flap is usually used to repair the defect. For lesions of the anterior floor of mouth, a full-thickness resection of the anterior mandible (arch) is required. Techniques for reconstruction include the use of trapezius myocutaneous flap with a portion of the scapular spine to bridge the bony gap, or the use of a free flap.

Irradiation Technique Superficial T1 cancers are treated with either brachytherapy or intraoral cone RT to approximately 65 Gy and the neck is observed. Larger lesions are treated with EBRT to 45 to 50 Gy over 5 weeks followed by an interstitial implant for an additional 20 to 30 Gy.

Lesions that are suitable for intraoral cone RT may be boosted with this technique prior to EBRT of the primary lesion and upper neck. Use of EBRT alone results in suboptimal cure rates and is discouraged.

External-Beam Irradiation.

Opposed lateral EBRT portals are used to treat anterior floor of mouth carcinomas. The entire width of the mandibular arch is included and the superior border is shaped to spare part of the parotid gland. The level I and level II nodes are included to the level of the thyroid notch if the neck is clinically negative; the lower neck may be electively irradiated. If the neck is clinically positive, the portals are enlarged to include all of the upper neck nodes, and en face low neck field is added. IMRT may be useful to reduce the dose to the contralateral parotid in patients with positive nodes.

Interstitial Irradiation.

Implantation of Tl-T2 lesions confined to the floor of the mouth with minimal extension to the mucosa of the tongue can be accomplished with iridium using the plastic tube technique.

Intraoral Cone Irradiation.

Intraoral orthovoltage or electron cone RT requires daily positioning by the physician and is preferable to interstitial RT because there is little or no irradiation of the mandible. An intraoral cone can be used for well-circumscribed anterior superficial lesions and is easiest to perform in the edentulous patient.

Combined Treatment Policies

Postoperative RT is preferred, because the risk of bone Complications and fistulae is higher with preoperative RT. Concurrent chemotherapy may be necessary based on pathologic findings. Preoperative RT may be used if the patient has a large fixed node.

Management of Recurrence

RT failures are treated by an operation. The salvage rate is good for patients with Tl-T2 lesions and poor for those with more advanced lesions. Surgical treatment failures may be treated by a repeat operation and postoperative RT.

Results of Treatment

Rodgers et al reported on 194 patients treated with surgery and/or RT at the University of Florida between 1 9 64 and 1 9 8 7. The local control rates after RT versus surgery alone or combined with RT were Tl, 32 of 37 (86%) versus 10 of 11(91%) ; T2, 25 of 36 (69%) versus 16 of 19 (84%) ; T3, 11 of 20 (55%) versus 9 of 9 (100%) ; and T4, 2 of 5 (40 %) versus 6 of 10 (60 %) . The local control rates are similar for Tl and T 2 tumors for the various treatment groups; those with T3 and T4 cancers have better local control after surgery and RT compared with RT alone. The 5 -year cause-specific survival rates were comparable for the treatment groups. Mild to moderate and severe complications were observed as follows:

RT alone, 49 of 117 (42 %) and 6 of 117(5%) ; surgery alone, 3 of 36 (8%) and 6 of 36 (17 %) ; and surgery and RT, 8 of 41 (20%) and 6 of 41 (15%) , respectively. Two hundred seven patients treated with RT alone at the Centre Alexis Vautin between 1 976 and 1 992 were reviewed by Pernot et al. Local control and cause-specific survival rates at 5 years were as follows: T l , 97% and 8 8 % ; T2, 72 % and 47%; and T3, 5 1 % and 36%, respectively. Six percent of patients developed complications necessitating surgical intervention and one patient

experienced a fatal complication Follow-Up There are two major difficulties in follow-up after RT: soft tissue ulcers and enlarged submandibular glands. An ulcer in the floor of the mouth within 2 years of treatment can be either recurrence or necrosis. If the lesion appears to be soft tissue necrosis, a trial of conservative therapy is adequate. Failure to stabilize or resolve is an indication for biopsy. A negative biopsy does not rule out recurrence, and repeat deep biopsies may be necessary. An enlarged submandibular gland(s) may be a sequel to obstruction of the submandibular duct; contrast enhanced CT is useful to distinguish between an enlarged submandibular gland and tumor in a lymph node. Follow-up of surgical cases may be difficult if skin grafts or flaps have been used because of the associated induration and thickness of the flaps. If the submandibular ducts have been reimplanted, stenosis may occur with subsequent enlargement of the submandibular glands.

Complications of Treatment

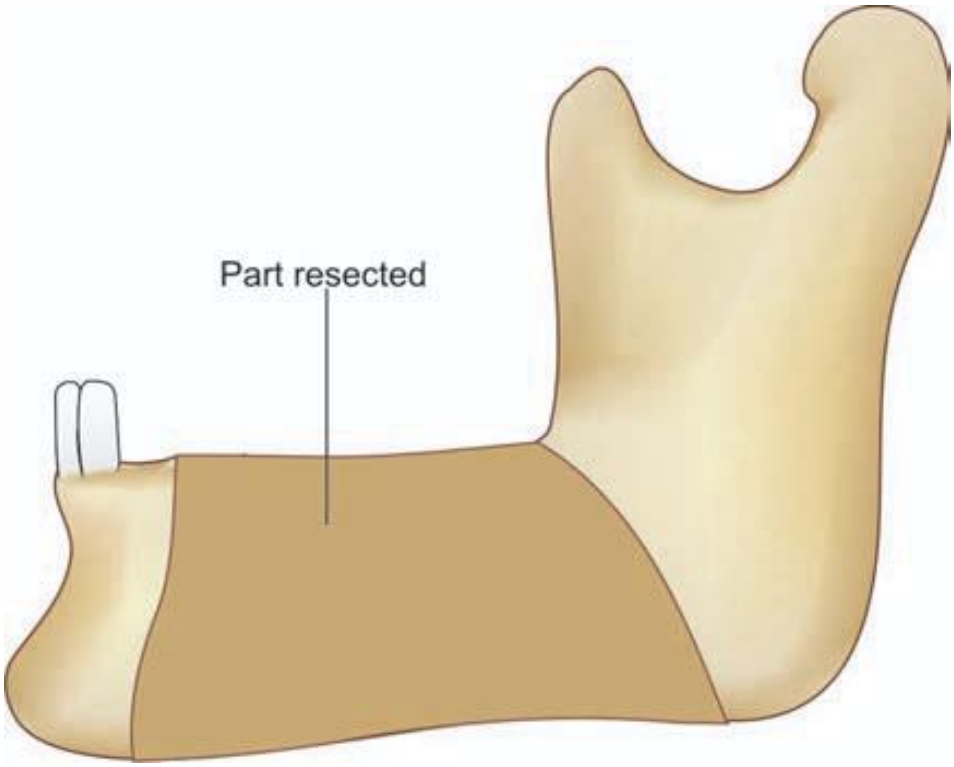
Radiation Therapy. A small soft-tissue necrosis may develop, usually in the site of the original lesion where the dose is highest. These are moderately painful and respond to local anesthetics, antibiotics, and the tincture of time. Treatment with pentoxifylline 400 mg three times daily may be beneficial. If the ulceration develops on the adjacent

gingiva, the underlying mandible is exposed. These areas are mildly painful. They are managed by discontinuing dentures, local anesthetics, antibiotics,and smoothing of the bone by filing if needed. These small bone exposures do not often progress to osteoradionecrosis (ORN) and either sequestrate a small piece of bone or are simply recovered by mucous membrane. Severe ORN may require daily hyperbaric oxygen treatments for 4 to 6 weeks, either alone or in conjunction with surgical intervention.

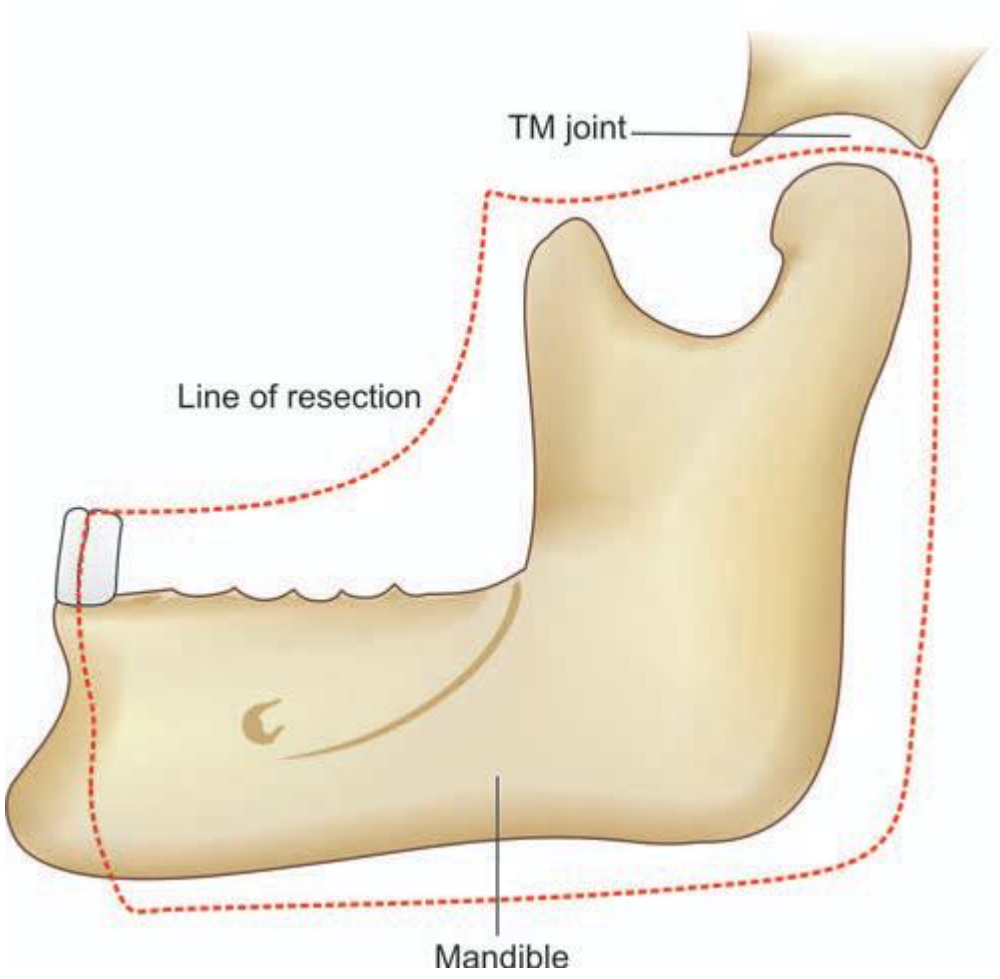
Surgical:

These include bone exposure, orocutaneous fistula, and failure of osteomyocutaneous flaps. Salvage procedures after RT are associated with an increased risk of complications.

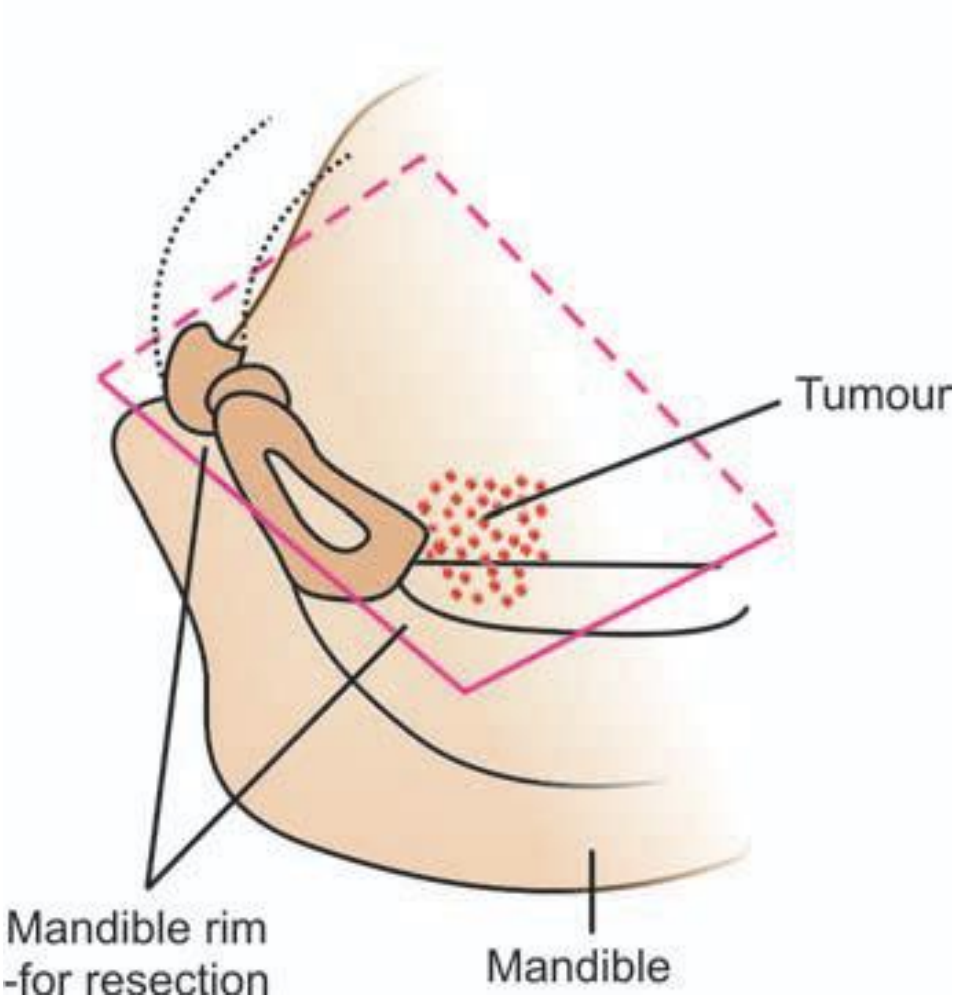
SEGMENTAL MANDIBULAR RESECTION



HEMIMANDIBULECTOMY



RIM RESECTION



ORAL TONGUE

Anatomy

The circumvallate papillae locate the division between oral tongue and base of tongue. The arterial supply is mainly by way of paired lingual arteries that are branches of the external carotid. The sensory pathway is by the way of the lingual nerve to the gasserian ganglion.

Pathology

More than 9 5 % of oral tongue lesions are SCCs. Coexisting Leukoplakia is common. Verrucous carcinoma and minor salivary gland tumors are uncommon. Granular cell myoblastoma is a benign tumor of uncertain origin that occurs on the dorsum of the tongue and may be confused histologically with carcinoma.

Patterns of Spread

Primary

Nearly all SCCs occur on the lateral and ventral middle and Posterior thirds of the oral tongue. They tend to remain in the tongue until large, unless they originate near the junction with the floor of the mouth. PNI and vascular space invasion may occur Anterior third (tip)

lesions usually are diagnosed early. Advanced lesions invade the floor of the mouth and root of the tongue, producing ulceration and fixation. Middle-third lesions invade the musculature of the tongue and later invade the lateral floor of the mouth.

Posterior-third lesions grow into the musculature of the tongue, the floor of the mouth, anterior tonsillar pillar, base of tongue, and glossotonsillar sulcus.

Lymphatics

The first-echelon nodes are the level Ib and II nodes. The Submental and level V lymph nodes are seldom involved. Rouvier describes lymphatic trunks that bypass the level I-II nodes and terminate in the level III lymph nodes. Byers et al. evaluated nodal spread patterns in patients treated surgically at the M. D. Anderson Cancer Center and observed skip metastases to the level III or IV nodes without involvement of levels I and II in 1 6 % of patients. Thirty-five percent of patients with oral tongue cancer have clinically positive nodes on admission; 5 % are bilateral. The incidence of occult disease i s approximately 30 % . The incidence of positive nodes increases with T stage. Patients with N1 or N2 ipsilateral nodes have a significant risk of developing node metastasis in the opposite neck.

Clinical Picture

Mild irritation of the tongue is the most frequent complaint. As ulceration develops, the pain worsens and is referred to the external ear canal. Extensive infiltration of the muscles of the tongue affects speech and deglutition and is associated with a foul odor. Extent of disease is determined by visual examination and palpation. The tongue protrudes incompletely and toward the side of the lesion as fixation develops. Posterior oral tongue lesions may grow behind the mylohyoid, and present as a mass in the neck at the angle of the mandible. Invasion of the hypoglossal nerv e is rare.

Differential Diagnosis

The differential diagnosis includes granular cell myoblastomas, which are usually slow growing, nontender masses, and 0.5 to 2.0 cm in size. The lesions are well circumscribed, firm, and slightly raised; they may be multiple. Aggressive behaviour is rare, and wide local excision is preferred. Pyogenic granulomas mimic small exophytic carcinomas. Tuberculous ulcer and syphilitic chancre are rare.

Treatment

Selection of Treatment Modality

Both surgery and RT result in cure rates that are similar for similar stages. The disadvantages of surgery include removal of part of the tongue and the decision of whether or not to do a neck dissection for the NO neck. The disadvantage of RT is the risk of necrosis. Excisional Biopsy (TX) . Excisional biopsy of a small lesion may show inadequate or equivocal margins. An interstitial implant or re-excision will produce a high rate of local control.

Early Lesions (T1 or T2).

A partial glossectomy with primary closure or a skin graft may be done transorally and is usually the preferred therapy. Depending on the depth of invasion, an elective neck dissection may be indicated. Postoperative RT would only be added for indications previously discussed.

Moderately Advanced Lesions (T2 or T3).

The preferred treatment for the majority of these patients is partial glossectomy, neck dissection, and postoperative RT-based treatment. Advanced Lesions (T4). Bi- or trimodality treatment will cure the

minority of these patients . Some patients are best treated with palliative intent.

Surgical Treatment

Early Lesions (T1 or T2) .

Partial glossectomy and primary closure is performed. Moderately Advanced Lesions (T2 or T3). Deeply infiltrative lesions are managed by partial glossectomy followed by postoperative RT or chemoRT based on pathologic features. Frozen section control is an essential part of the procedure; positive margins are an indication for excision of additional tissue.

Advanced Lesions (T4) .

Advanced lesions would require a total glossectomy and sometimes a laryngectomy combined with postoperative RT or chemoRT.

Irradiation Technique

The ability to control the primary lesion is enhanced by giving all or part of the treatment by interstitial RT or by intraoral cone.Superficial T1 tumors may be treated with iridium-192 brachytherapy alone using the plastic tube technique. Larger lesions that have an increased risk for

subclinical neck disease may be treated with EBRT and a brachytherapy boost or with brachytherapy combined with an elective neck dissection. The time factor is critical for oral tongue cancer, and the EBRT part of the treatment is shortened (3 0 Gy in ten once-daily fractions or 3 8 .4 Gy in 1 . 6 Gy twice-daily fractions) in order to increase the proportion of the RT given by either interstitial or intraoral cone therapy. The interstitial therapy is given after the EBRT; the intraoral cone therapy should be done prior to the EBRT. The authors favor elective neck RT for nearly all lesions.

Combined Treatment Policies

Postoperative RT is administered to the primary site and neck for indications previously outlined; chemoRT may be indicated based on pathologic findings. IMRT may be useful to reduce the dose to one or both parotids. Preoperative RT, often with chemotherapy, is advised when fixed nodes are present.

Management of Recurrence

Local recurrence after RT or surgery is heralded by ulceration, pain, or increased induration. Recurrences have a slightly elevated or rolled border, whereas necroses do not. Biopsy should be done as soon as ulceration appears, if it is within the original tumor site. Ulcers that

appear on adjacent normal tissues are likely due to RT and not cancer. RT failure is managed by surgery. Surgical failure occasionally is salvaged by re-resection and postoperative RT-based treatment. Recurrence in the soft tissues of the neck is rarely eradicated by any procedure. Nodes appearing in a previously untreated neck are managed by neck dissection with or without postoperative RT; chemoRT is indicated if ECE is present.

Results of Treatment

The local control rates for 1 70 patients treated with RT alone versus surgery alone or with RT between 1 964 and 1 990 at the University of Florida were T 1 , 79 % versus 76% (P = .76); T2, 72 % versus 76% (P = . 8 6) ; T3, 45 % versus 8 2 % (P = . 0 3) ; and T4, 0 % versus 67% (P = . 0 8) .230 Local control rates for T1 or T2 cancers are comparable after RT versus surgery; patients with T3 or T4 lesions have improved local control if surgery is part of the treatment. The differences in 5-year survival between the two treatment groups were not statistically significant. The results of brachytherapy alone or combined with EBRT for 448 patients treated at the Centre Alexis Vautin were reported by Pernot et al. and revealed the following 5-year local control and survival rates: T 1 , 93 % and 6 9 % ; T2, 65 % and 4 1 % ; and T3, 4 9 % and 25 % , respectively. Shorter time intervals between brachytherapy and

EBRT were associated with significantly improved local control and survival for those who received both modalities.

Complications of Treatment

Surgical:

Orocutaneous fistula, flap necrosis, and dysphagia are the most common complications after surgery of the tongue . Damage to the lingual nerve or the hypoglossal nerve, although rare, is associated with difficulty in swallowing and/or speaking. Fistula and flap necrosis must be handled judiciously because the danger of carotid artery hemorrhage increases with either of these complications. Enunciation difficulties occur whenever the tongue is bound down by scarring. The incidence of complications increases for surgical salvage attempts after RT failure. Thirteen of 65 patients (20 %) treated with surgery alone or combined with RT at the University of Florida developed significant complications.

Radiation Therapy.

A minor soft tissue necrosis is fairly common; considerable patience is required for healing. Broadspectrum antibiotics, local anesthetics such as viscous lidocaine, and analgesics are prescribed as needed. Pentoxifylline 400 mg three times daily may be beneficial. Hyperbaric oxygen treatment may be tried in difficult cases. If the

necrosis is persistent and pain is uncontrollable, the lesion must be resected.

Radiation-Induced Bone Disease.

The edentulous person is less likely to develop serious RT-induced mandibular damage than a person with teeth. The most frequent problem involving the mandible is a bone exposure. The gingiva disappears, exposing the underlying bone. If the exposed area is small, the patient is often unaware of the problem. If the patient has dentures, those dentures should be discontinued or altered to relieve the pressure over the exposed bone. If sharp bony edges appear, they are filed and the bone edge lowered to speed healing. Healing may require months or even years. If ORN develops, hyperbaric oxygen has been used with some success. Conservative measures should be given a fair trial, but if unsuccessful, segmental mandibulectomy and an osteomyocutaneous flap reconstruction is performed. Severe complications were observed in 9 of 1 05 patients (9 %) treated with RT at the University of Florida. Pernot et al observed the following soft tissue and/or bone complications in a series of 448 patients: grade 1, 19 % ; grade 2, 6% ; and grade 3, 3% .

BUCCAL MUCOSA

Epidemiology

SCC is relatively uncommon in the United States. In southern India it is common and is related to chewing a combination of tobacco mixed with betel leaves, areca nut, and lime shell

Anatomy

The buccal mucosa is the mucous membrane covering the inner surface of the cheeks and lips, ending above and below with a transition to the gingiva. It ends posteriorly at the retromolar trigone. The parotid duct opens into the buccal mucosa opposite the second upper molar. It is innervated by a branch of the mandibular nerve, which is sensory to the buccal mucosa, and the skin of the cheek that covers the buccinator muscle.

Pathology

Most malignant tumors are low-grade SCC , frequently appearing on a background of leukoplakia or lichen planus. Verrucous carcinoma occurs. Minor salivary gland tumors and melanomas are rare.

Patterns of Spread

Almost all SCCs originate on the mucosa lining the cheeks; primary lesions seldom originate from the wet mucosa of the lips.

Early lesions are usually discrete and exophytic. As they enlarge, they penetrate the underlying muscles and eventually extend to the skin. Peripheral growth occurs into the gingivobuccal sulci and eventually onto the gingiva and into bone. The lymphatic spread is first to the level I and level II nodes. The incidence of positive nodes on admission is 9% to 31%, and the risk o f occult disease is 16 %.

Clinical Picture

Small lesions produce the sensation of a lump that is felt with the tongue. Pain is minimal, unless there is posterior extension to involve the lingual and dental nerves. Pain may be referred to the ear. Obstruction of the Stensen's duct will produce parotid enlargement. Extension posteriorly, behind the pterygomandibular raphe or into the buccinator and masseter muscles, causes trismus.

Differential Diagnosis

The differential diagnosis include syphilis and tuberculosis; both are rare. If the first biopsy reveals chronic inflammation or pseudoepitheliomatous hyperplasia, repeat biopsy may be necessary.

Treatment

Selection of Treatment Modality

Small lesions (< 1 cm) may be excised with primary closure; small lesions that involve the lip commissure are sometimes treated by RT. Lesions 2 to 3 cm in size can be treated with surgery or by RT, usually the former. Larger lesions are usually treated with surgery, and postoperative RT or chemoRT.

Surgical Treatment.

Lesions that invade the mandible or maxilla require bone resection along with the soft tissues. Repair may require a maxillary prosthesis. A myocutaneous flap repairs full-thickness removal of the cheek.

Irradiation Technique.

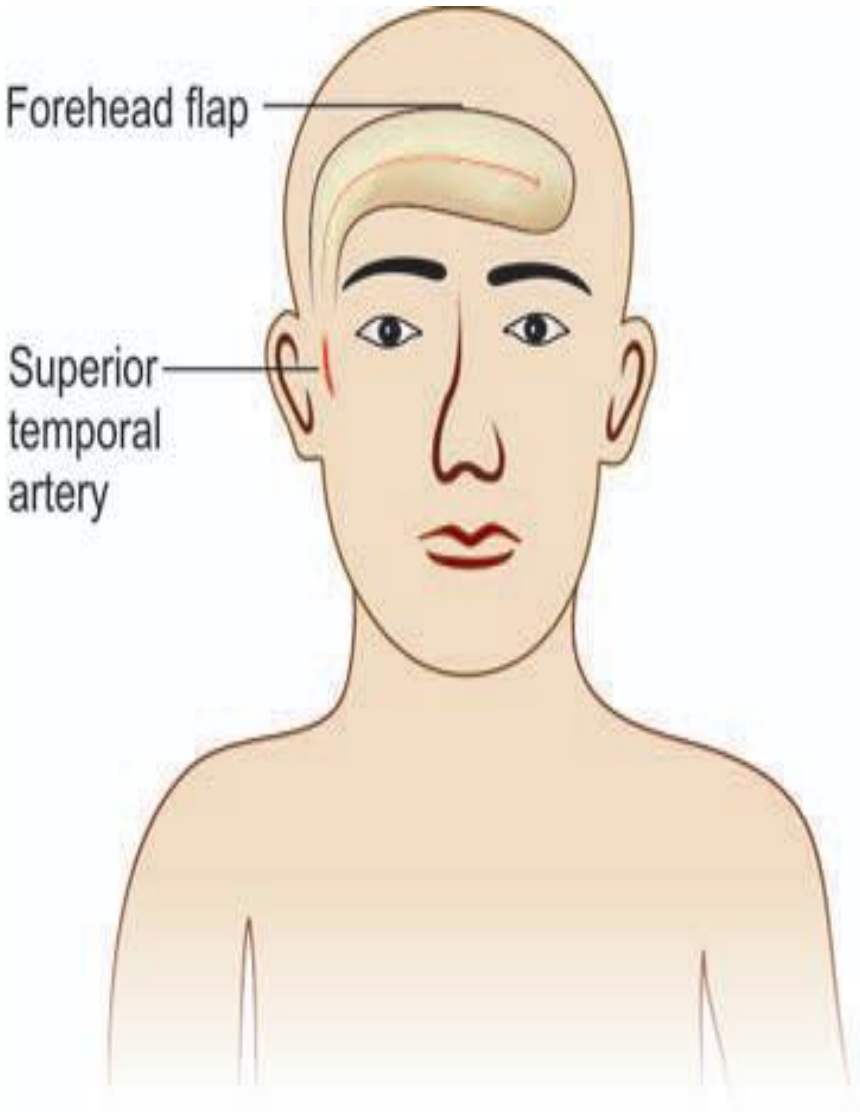
Buccal mucosa lesions are suited for treatment with electrons, intraoral cone, and interstitial techniques to spare the contralateral normal tissues. When tumors extend into one of the gingivobuccal gutters or onto bone, treatment must be entirely by EBRT.

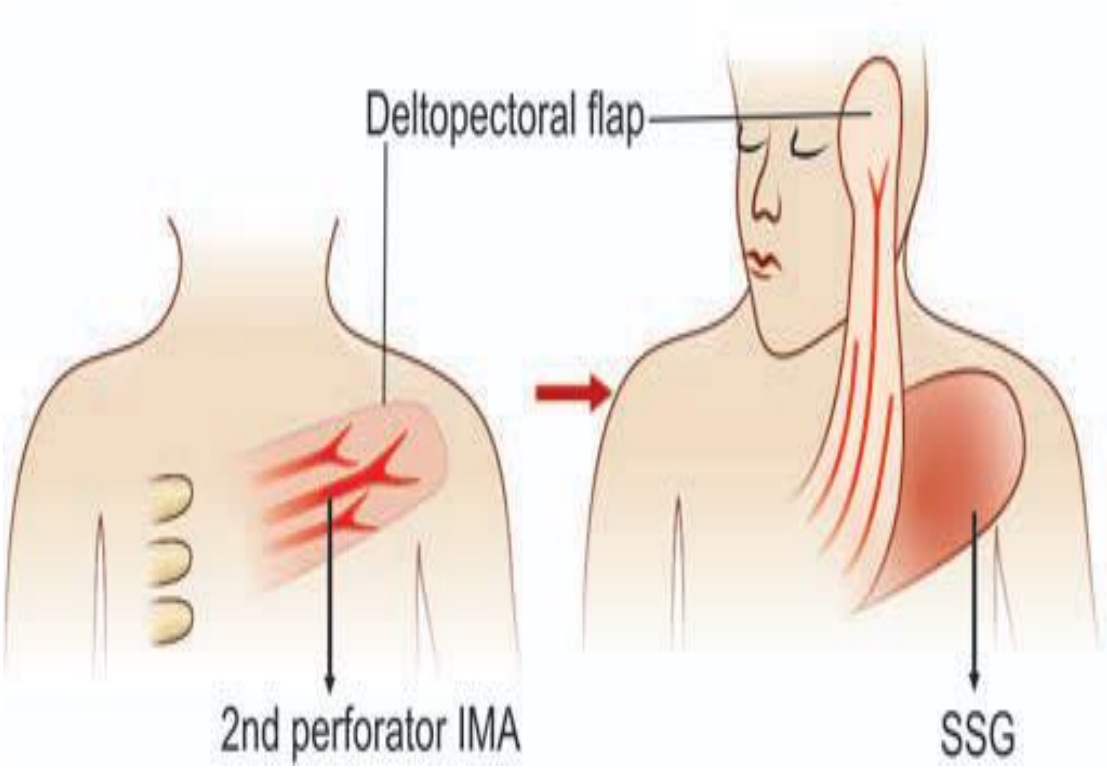
Results of Treatment

Diaz et al. recently reported the M. D. Anderson experience for 11 9 patients treated with surgery alone (84 patients) or combined with adjuvant RT (35 patients) between 1974 and 1993. Tumor recurrence developed in 54 patients (45%) : local recurrence in 27 patients (23%); regional recurrence in 13 patients (11%); local and regional recurrence in 11 patients (9%) ; and distant metastases in 3 patients (3%). The 5-year survival rates versus stage were stage I, 78 % ; stage II, 66 % ; stage III, 62 % ; stage IV, 5 0 % ; and overall, 63 %. Nair e t al reported the definitive RT results for 2 3 4 cases o f buccal mucosa cancer treated in southern India during the 1982 calendar year. The 3-year disease-free survival rates were stage I, 85 % ; stage II, 63 % ; stage III, 41 %; and stage IV, 15 % . Thirty-two patients had verrucous carcinoma; the 3-year disease-free survival rate was 47 % , similar to that for other grades of scc.

Complications of Treatment

The buccal mucosa is tolerant of high-dose RT, and complications are uncommon. Bone exposure may appear on the mandible or maxilla. Trismus may develop if the muscles of mastication receive high doses. Surgical injury of Stensen's duct may cause obstruction and parotitis. Injury to branches of the VII nerve may occur. Split-thickness skin grafts may shrink and produce partial trismus. Resection of the lip commissure may produce oral incompetence.


Forehead flap
Superior temporal artery


Deltopectoral flap
2nd perforator IMA
SSG

GINGIVA AND HARD PALATE

(INCLUDING RETROMOLAR TRIGONE)

Anatomy

The lower gingiva includes the keratinized masticatory mucosa covering the mandible from the gingivobuccal gutter to the origin of the nonkeratinized lining mucosa covering the floor of the mouth. The retromolar trigone lies behind the third molar and is contiguous superiorly with the maxillary tuberosity. Beneath the keratinized mucosa of the retromolar trigone is the tendinous pterygomandibular raphe, which is attached to the pterygoid hamulus and the posterior mylohyoid ridge of the mandible and serves as the insertion of the buccinator, orbicular oris, and superior pharyngeal constrictor muscles. Behind the pterygomandibular raphe and between the medial pterygoid muscle and the ascending ramus is the pterygomandibular space, containing the lingual and dental nerves; it is related posteriorly to the deep lobe of the parotid and the parapharyngeal space. There are no minor salivary glands in the mucous membranes of the alveolar ridges.

Pathology

Most neoplasms of the lower alveolar ridge and retromolar trigone are SCCs; SCC is relatively uncommon on the upper alveolar ridge and hard palate, where minor salivary gland tumors, usually adenoid cystic carcinomas, are more frequent. Verrucous carcinomas occur, usually on the lower gingiva.

Melanoma has been reported. scc may arise within the body of the mandible or maxilla either from odontogenic epithelium or from epithelium trapped during embryonic development. It is more frequent in the mandible than the maxilla, and is most common in the molar regions. It must be distinguished from metastatic scc and ameloblastoma. Ameloblastoma is a rare, benign, locally agg ressive odontogenic tumor with an incidence of about 1 % of all tumors of the maxilla and mandible; about 8 0 % of cases occur in the mandible with the molar-ramus region most commonly involved.

Patterns of Spread

Lower Gum

scc invades the periosteum and the adjacent buccal mucosa and floor of the mouth. Slow-growing, low-grade lesions tend to produce a smooth, saucerized defect before invading the mandible. Moderate to high-grade lesions invade the bone directly or through recently opened dental sockets and produce a lytic defect. Lymphatic spread is to the level I and level II nodes. Eighteen percent to 52% have clinically positive nodes on admission; occult disease occurs in 17% to 19%. Ameloblastoma expands and destroys the bone and extends to adjacent areas by contiguous growth. Ameloblastic carcinoma, a rare malignant variant of ameloblastoma, may give rise to regional and distant metastasis.

Upper Alveolar Ridge and Hard Palate

Most SCCs originate on the gingiva and spread secondarily to the hard palate, soft palate, buccal mucosa, and underlying bone. The maxillary antrum is invaded late unless there are recent extractions providing access. The risk for positive lymph nodes at diagnosis is 13% to 24 % , and the incidence of occult disease is 22%.

Retromolar Trigone

Carcinomas spread to the adjacent buccal mucosa, anterior Tonsillar pillar, and maxilla early. Posterior spread occurs into the pterygomandibular space and the medial pterygoid muscle. Posterolateral spread occurs into the buccinator muscle and fat pad. The first echelon lymphatics are the level I and level II nodes. The incidence of clinically positive nodes on presentation is about 30 % ; the risk for occult disease is 15% to 25% .

Clinical Picture

The patient with SCC may present to the dentist first with ill fitting dentures, pain, loose teeth, or a sore that will not heal. A history of inappropriate dental extractions or root canal therapy is common. Invasion into the mandible may involve the inferior dental nerve and produce paresthesia of the lower lip. A background of leukoplakia is frequently present. Retromolar trigone lesions have pain referred to the external auditory canal and preauricular area. Invasion of the pterygoid muscle produces trismus. Intra-alveolar SCC presents with a submucosal mass and dental symptoms. Roentgenograms show a lytic lesion in the mandible.

Ameloblastoma exhibits few symptoms in the early stages. Patients may notice a gradually increasing facial deformity or loosening of teeth. An intraoral submucosal mass may be present initially; ulceration occurs as the mass increases in size. On roentgenograms, a radiolucent area is seen with the following: expansion of the overlying cortical plate, scalloped margins, a multilocular appearance, and/or resorption of the roots of adjacent teeth. Minor salivary gland tumors present as a submucosal mass, enlarge slowly, and may develop a central ulceration.

Differential Diagnosis

The differential diagnosis includes dental disease and underlying bony cysts or tumors.

Treatment

Selection of Treatment Modality

Lower Alveolar Ridge.

The majority of lesions are managed by operation. Postoperative RT or chemoRT may be indicated depending on pathologic findings.

Ameloblastoma.

The treatment for ameloblastoma is surgery; however, local recurrence is a problem. Sehdev et al. reported curettage was followed by local recurrence in 90% of mandibular and in all maxillary ameloblastomas. Subsequent resection controlled 80 % of the mandibular but only 40% of the maxillary tumors. The initial use of segmental mandibular resection controlled 78 % (18 of 23 patients) with subsequent resection controlling those that recurred. The use of partial maxillectomy as the first treatment controlled 100% (7 of 7 patients) of maxillary ameloblastomas as opposed to only 40 % when partial maxillectomy was performed for recurrence. Limited experience with RT suggests that it may reduce the probability of progression and result in long-term local control in the occasional patient with incompletely resectable disease.

Retromolar Trigone.

Surgery is preferred for discrete early lesions. RT is recommended for superficial lesions involving a large surface area. Advanced carcinomas are treated with surgery and postoperative RT with or without chemotherapy. Upper Alveolar Ridge and Hard Palate. Resection is the usual treatment for most lesions; postoperative RT or chemoRT is added as needed. However, if the lesion is superficial and extensively involves

the hard palate or involves a significant portion of the soft palate, then an RT-based approach should be considered for the initial therapy. If the lesion is small and discrete and there is no bone involvement, resection includes the periosteum or occasionally some underlying bone. Bone invasion requires a maxillectomy that is tailored to optimally resect the cancer. The resulting defect is usually rehabilitated with a removable prosthesis that restores midfacial contour and palatal function so that speech articulation, mastication, and deglutition are normalized.

Surgical Treatment

Rim Resection (Marginal Mandibulectomy) . For discrete Tl-T2 carcinomas with minimal cortical bone invasion, at least 1 cm of the inferior border of the mandible is preserved, maintaining its biomechanical integrity.

Segmental Mandibulectomy.

For lesions with transcortical bone invasion into the medullary space, a segment of the mandible is removed in continuity with the tumor. Massive anterior lesions may necessitate removal of the mandible from angle to angle; tumors that invade the mandible posterior to the

angle may require condylar resection. Reconstruction is ideally accomplished with a revascularized osteomyocutaneous flap.

Irradiation Technique

Small lesions of the lower alveolar ridge and retromolar trigone may be treated by intraoral cone for all or part of their therapy. Well-lateralized lesions of the retromolar trigone and posterior alveolar ridge may be treated by either an ipsilateral mixed beam or IMRT; the latter is preferred. Parallel-opposed portals treat anterior gum lesions. Carcinomas that involve a large surface area with little or no bone invasion may be treated by EBRT. Tl-T2 carcinomas are treated with altered fractionation; larger tumors are treated with combined EBRT and concomitant chemotherapy.

Management of Recurrence

RT failures are managed by operation. Surgical failures may be managed by surgery and postoperative RT.Salvage procedures frequently are not attempted because of the advanced nature of the recurrence and the low chance of cure.

Results of Treatment

Mandibular Gingiva. Overholt et al. reported 155 patients with SCCs of the lower alveolar ridge treated at M. D. Anderson between 1970 and 1990. Surgery alone was used for 131 patients and the remainder received surgery and RT. Five-year survival for patients with Tl and T2 cancers were 85 % and 84 % , respectively, compared with 66% and 64%, respectively, for those with T3 and T4 malignancies. Local control at 2 years was impacted by tumor size (P=.021) and margin status (P=.027), whereas 5-year cause-specific survival was influenced by tumor size (P=.001) , margin status (P=.011), mandibular invasion (P<.05), and the presence of lymph node metastases (P<.001). Retromolar Trigone. Byers e t al. reported the M. D. Anderson results for 110 previously untreated patients with scc of the retromolar trigone treated between 1965 and 1977, with a minimum 5-year follow-up. Surgery was often selected for patients with leukoplakia, poor teeth, mandible invasion, large neck nodes, or trismus. RT was selected for poorly differentiated tumors, for mainly exophytic lesions, and lesions involving the faucial arch or soft palate, or lesions having ill-defined borders, and for patients who had poor surgical risk. The local control rates were as follows: T l , 12 of 13 (92 %) ; T2, 50 o f 57 (88%) ; T3, 18

of 20 (90%) ; and T4, 15 of 20 (75%). Local control was similar after surgery/RT. The absolute 5-year survival rate was 26%. Mendenhall et al. reported on 99 patients with retromolar trigone SCCs treated between 1966 and 2003 with RT alone (35 patients) or combined with surgery (64 patients). The 5-year locoregional control rates after RT versus surgery and RT were stages I-III, 51 % and 87 % ; stage IV, 42 % and 62 % ; and overall, 48 % and 71 %, respectively. The 5 –year cause-specific survival rates after RT versus surgery and RT were stages I-III, 5 6 % and 83% ; stage IV, 50 % and 61 % ; and overall, 52 % and 69 %, respectively. Multivariate analysis revealed that the likelihood of cure was better after surgery and RT compared with definitive RT. Hard Palate. Shibuya et al. reported the results for 3 8 cases of carcinoma of the hard palate and 82 cases of carcinoma of the upper alveolar ridge treated between 1953 and 1982 in Japan. Sixty-six patients were managed initially by RT alone to the primary lesion, and 54 patients were managed by RT and surgery. The 5 -year actuarial survival rate by stage was the following: stage I, 56% ; stage II, 41 %; stage III, 32 % ; and stage IV, 12 % . There was no difference in survival when comparing hard palate versus upper alveolar ridge, scc versus minor salivary gland tumors, or RT alone versus RT plus surgery as the initial therapy. The overall risk for metastatic lymph nodes was 47% for hard palate and 49 % for the upper alveolar ridge.

Thirty patients were recorded as having "slight bone invasion" and no metastases and had a 5-year survival rate of 75 % when treated by RT.

Complications of Treatment

Surgical complications include orocutaneous fistula, bone exposure, extrusion of a metal tray, and loss of graft or flap. Following hemimandibulectomy, the edentulous patient usually cannot wear dentures. The complications of RT include soft tissue necrosis, bone exposure, and ORN. The risk is greatest for patients with advanced lesions of the lower gum and retromolar trigone. Huang et al. reported the following rates of grade 3 bone and soft tissue complications in 65 patients treated for retromolar trigone carcinomas: preoperative RT, 0 of 10 patients (0%) ; surgery and postoperative RT, 5 of 39 patients (13%) ; and RT alone, 2 of 16 patients (13%) .

RESULTS

SECTION 1 : PROBLEMS WITH PARTS OF BODY

- On comparing the data between surgery and radiotherapy for problems with parts of body a significant p value of (.0001) was obtained indicating MORE PROBLEMS WERE WITH PEOPLE UNDERGOING RADIOTHERAPY.

SECTION 2 : PROBLEMS WITH ACTIVITY AND FUNCTIONING

- On comparing the data between surgery and radiotherapy for problems with activity and functioning, a significant p value of (.0001) was obtained indicating MORE PROBLEMS WERE WITH PEOPLE UNDERGOING RADIOTHERAPY.

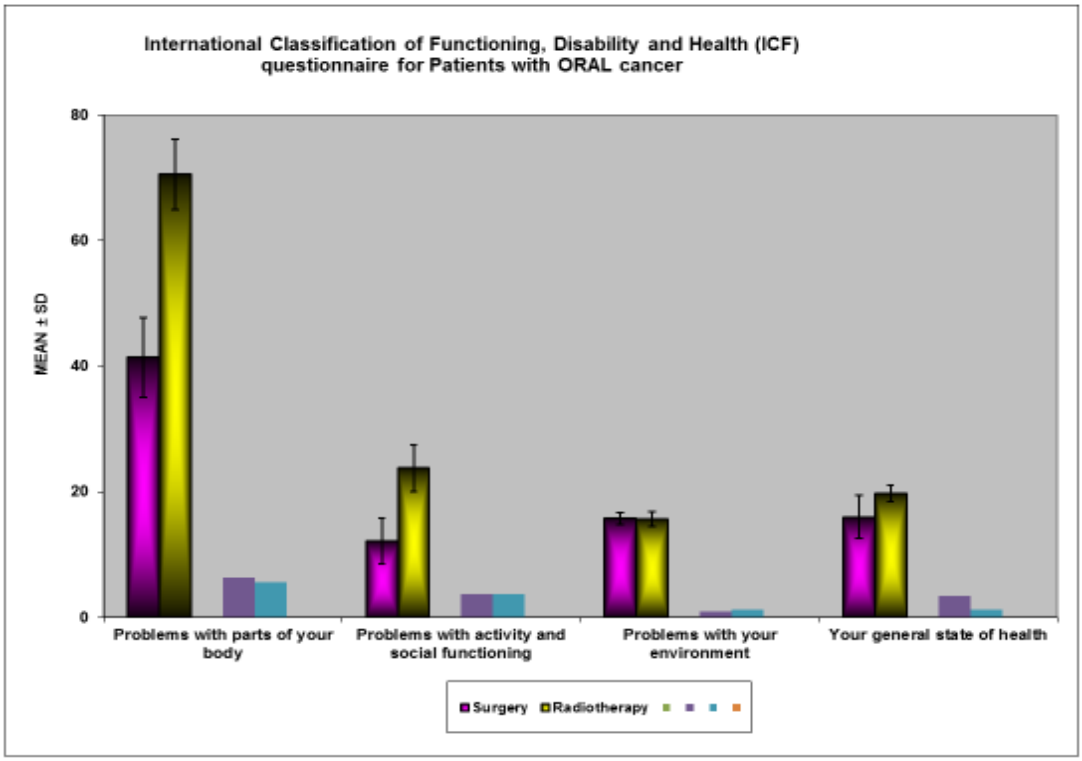
SECTION 3 : PROBLEMS WITH ENVIRONMENT

- On comparing the data between surgery and radiotherapy for problems with environment, a insignificant p value of (.746) was obtained indicating not much difference between either group of people.

SECTION 4 : PROBLEMS WITH GENERAL STATE OF HEALTH

- On comparing the datas between surgery and radiotherapy for problems with general state of health, a significant p value of (.0001) was obtained indicating MORE PROBLEMS WERE WITH PEOPLE UNDERGOING RADIOTHERAPY.

	MEAN		SD	
	SURGERY	RADIOTHERAPY	SURGERY	RT
Problems with parts of your body	41.41	70.61	6.34	5.64
Problems with activity and social functioning	12.12	23.78	3.65	3.75
Problems with your environment	15.76	15.65	0.97	1.15
Your general state of health	16	19.74	3.46	1.25


International Classification of Functioning, Disability and Health (ICF) questionnaire for Patients with ORAL cancer
MEAN ± SD
80
60
40
20
0
Problems with parts of your body
Problems with activity and social functioning
Problems with your environment
Your general state of health
Surgery
Radiotherapy

CONCLUSION

After comparing the results of four sections, people recieving radiotherapy alone seems to have much poor quality of life than people who underwent surgery but both of them had no difference in Environmental problems. But it has to be kept in mind that the age, sex, economic status, co-morbidities also affect the Quality of life in cancer patients.

ABSTRACT

AIMS & OBJECTIVES

Though there has been many advancements in treatment and diagnostic techniques, in detecting carcinomas, there has been not much about the quality of life of assessement of cancer patients.Many studies concentrate on the treatment and prognosis forgetting the fact of quality of life.This study is to assess the quality of life of oral carcinoma patients who underwent surgery or radiotherapy and to weigh their importance accordingly.

METHODOLOGY

50 oral cancer patients who underwent surgery (25 patients) and RT (25patients) in Stanley medical college for stage 1 and stage 2 lesions of oral carcinoma for past 3 Years (2013-2015) will be enrolled. Their quality of life assessment will be done using The WHO adopted INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) QUESTIONNAIRE. The ICF comprises of 4 sections. They are

SECTION 1: Comprises of PROBLEMS WITH PARTS OF THE BODY. SECTION 2: Comprises of PROBLEMS WITH ACTIVITY AND SOCIAL FUNCTIONING. SECTION 3: Deals with PROBLEMS WITH THE ENVIRONMENT. SECTION 4: Deals with GENERAL STATE OF HEALTH.

RESULTS & CONCLUSION

After comparing the results of four sections, people recieving radiotherapy alone seems to have much poor quality of life than people who underwent surgery but both of them had no difference in Environmental problems. But it has to be kept in mind that the age, sex, economic status, co-morbidities also affect the Quality of life in cancer patients.

International Classification of Functioning, Disability and Health (ICF) questionnaire for Patients with Head and Neck cancer

(version 1-7-10)

Thank you for taking part in this survey. There are 38 questions asking about problems you have**.** We would like to know how much of a problem these are to you. We also would like to know if these problems are linked to your head and neck cancer in some way or whether they are caused entirely by another illness unrelated to your head and neck cancer.

For example one question asks if you have problems with pain. If you have a moderate amount of pain and your head and neck cancer is **partly** or **entirely** responsible for this then you should answer as below:

						Entirely due to Something else
	None	Mild	Moderate	Severe	Complete	
Pain	1	2	3	4	5	*Yes*

Alternatively, if your moderate amount of pain is **entirely** due to something else, such as arthritis in your hip, then you should answer as below:

	How much of a problem?					*Entirely due to Something else*
	None	Mild	Moderate	Severe	Complete	
Pain	1	2	3	4	5	*Yes*

The actual questions start on the next page. There are four sections. In sections 1 and 2 we have asked you to grade your problem as **none, mild, moderate, severe** or **complete.**

Please use the following definitions to help you decide which grade to choose:

NONE - things are the same as before your cancer diagnosis and treatment. **MILD** - at a level that you can tolerate, occurs rarely.

MODERATE -sometimes interferes with your day to day life, happens occasionally. **SEVERE** - partly disrupts your day to day life, occurs frequently. **COMPLETE** - totally disrupts your day to day life, affects you every day.

In section 3 we ask about how things in your living environment may have helped or hindered your progress.

Finally in section 4 we ask you to rate your general state of health and to rate your general level of functioning.

Now please answer the questions on the next page. Thank you

Patient study number _____

Date

PLEASE ANSWER ALL 38 QUESTIONS BY CIRCLING THE MOST APPROPRIATE OPTION

SECTION 1: Problems with parts of your body

We mean a problem or impairment with a part of your body, which means you have trouble doing something which you want to do.

PROBLEM						*Entirely due to Something else*
Do you have a problem with?	**None**	**Mild**	**Moderate**	**Severe**	**Complete**	
1.Biting	1	2	3	4	5	*Yes*
2.Chewing	1	2	3	4	5	*Yes*
3.Moving food around your mouth	1	2	3	4	5	*Yes*
4.Saliva	1	2	3	4	5	*Yes*
5.Swallowing	1	2	3	4	5	*Yes*
6.Sucking	1	2	3	4	5	*Yes*
7.Taste	1	2	3	4	5	*Yes*
8.Mouth function OVERALL.	1	2	3	4	5	*Yes*
9.Producing sound	1	2	3	4	5	*Yes*
10.Quality of sound (speech/ articulation)	1	2	3	4	5	*Yes*
11.Voice function OVERALL.	1	2	3	4	5	*Yes*
12.Emotional functioning (e.g. anxiety, mood)	1	2	3	4	5	*Yes*
13.Energy and drive (motivation).	1	2	3	4	5	*Yes*
14.Breathing in or out.	1	2	3	4	5	*Yes*
15.Structure of Teeth	1	2	3	4	5	*Yes*
16.Structure of Lips	1	2	3	4	5	*Yes*
17.Structure of Tongue	1	2	3	4	5	*Yes*
18.Roof of Mouth	1	2	3	4	5	*Yes*
19.Structure of other parts of mouth	1	2	3	4	5	*Yes*
20.Structure of your mouth OVERALL.	1	2	3	4	5	*Yes*
21.Structure of your throat	1	2	3	4	5	*Yes*
22.Structure of your voice box	1	2	3	4	5	*Yes*
23.Structure of other parts of your head & neck.	1	2	3	4	5	*Yes*
24.Structure of shoulder	1	2	3	4	5	*Yes*
25.Pain	1	2	3	4	5	*Yes*

SECTION 2: Problems with activity and social functioning

We mean a problem or difficulty with activity and social participation, such as being able to speak, eat or drink in ways that are socially and culturally acceptable to you.

DIFFICULTY						*Entirely due to Something else*
Do you have difficulty with?	**None**	**Mild**	**Moderate**	**Severe**	**Complete**	
26.Speaking	1	2	3	4	5	*Yes*
27.Drinking	1	2	3	4	5	*Yes*
28.Eating	1	2	3	4	5	*Yes*
29.Carrying out your daily routine	1	2	3	4	5	*Yes*
30.Supporting yourself financially	1	2	3	4	5	*Yes*
31.Family relationships	1	2	3	4	5	*Yes*
32.Intimate relationships	1	2	3	4	5	*Yes*

SECTION 3: Problems with your environment

We want to see how much certain factors in your living environment have either **helped** or **hindered** your progress **overall** since your diagnosis and treatment of head and neck cancer. Circle **one value only** for each of the following questions.

33. Overall how much has your immediate family been a help or a hindrance?

A HINDRANCE				**NEITHER**	**A HELP**			
Complete	Severe	Moderate	Mild		Mild	Moderate	Substantia l	Complete
-4	-3	-2	-1	0	1	2	3	4

34.**Overall,** how much have the health professionals involved in your care been a help or a hindrance?

A HINDRANCE				**NEITHER**	**A HELP**			
Complete	Severe	Moderate	Mild		Mild	Moderate	Substantia l	Complete
-4	-3	-2	-1	0	1	2	3	4

35.Overall, how much of a help or hindrance are the foods, liquids, vitamins etc that you consume?

A HINDRANCE				**NEITHER**	**A HELP**			
Complete	Severe	Moderate	Mild		Mild	Moderate	Substantia l	Complete
-4	-3	-2	-1	0	1	2	3	4

36.Overall, how much of a help or hindrance are your medicines (prescribed or bought over the counter)?

A HINDRANCE				**NEITHER**	**A HELP**			
Complete	Severe	Moderate	Mild		Mild	Moderate	Substantia l	Complete
-4	-3	-2	-1	0	1	2	3	4

SECTION 4: Your general state of health

37. In general, would you say your health is:

(The more to the left you make the cross, the better you consider that your health is. The more to the right you make your cross, the poorer you consider that your health is)

Excellent	0	1	2	3	4	5	6	7	8	9	10	**poor**

38. Please rank the magnitude of your problems with functioning in your everyday life

(The more to the left you make the cross, the better you consider your functioning to be. The more to the right you make your cross, the poorer you consider that your functioning is).

No problem	0	1	2	3	4	5	6	7	8	9	10	Complete problem

THANK YOU FOR TAKING THE TIME TO COMPLETE THIS QUESTIONNAIRE

PLEASE CHECK YOU HAVE GIVEN AN ANSWER TO EACH OF THE 38 QUESTIONS

BIBLIOGRAPHY

1. Sabiston textbook of surgery , edition 19.

2. Schwartz Manual of Surgery. 8th Ed. New York.

3. DeVita, Hellman, and Rosenberg's Principles & Practice of Oncology.

4. Bernier J, Cooper JS, Pajak TF, e t al. Defining risk levels i n locally advanced head and neck cancers: a comparative analysis of concurrent postoperative radiation plus chemotherapy trials of the EORTC (#2293 1) and RTOG (# 950 1) . Head Neck 2005;27: 843-8 50.

5. Brizel DM, Wasserman TH, Henke M, et al. Phase III randomized trial of amifostine as a radioprotector in head and neck cancer. Clin Oncol 2000; 1 8 : 3 3 39-3345.

6. Brizel DM, Murphy BA, Rosenthal DI, et al. Phase II study of palifermin and concurrent chemoradiation in head and neck squamous cell carcinoma. Clin Oncol 2008;26:2489-2496.

7. Byers RM, O'Brien J, Waxler. The therapeutic and prognostic implications of nerve invasion in cancer of the lower lip. Int Radiat Oncol Bioi Phys 1 978; 4:2 1 5-2 17.

8. Wang CC, Biggs PJ. Technical and radiotherapeutic considerations of intra-oral cone electron beam radiation therapy for head and neck cancer. Semin Radiat Onco/ 1 9 92;2: 1 7 1 .

9. Pernot M, Hoffstetter S, Peiffert D, e t a l . Epidermoid carcinomas of the floor of mouth treated by exclusive irradiation: statistical study of a series of 207 cases. Radiother Onco/ 1 9 95;35:177-1 85.

10. Byers RM, Weber RS, Andrews T, et al. Frequency and therapeutic implications of "skip matastases" in the neck from squamous carcinoma of the oral tongue. Head Neck 1 9 9 7; 1 9 : 14-1 9.

11. Mendenhall WM, Van Cise WS, Bova FJ, et al. Analysis of time-dose factors in squamous cell carcinoma of the oral tongue and floor of mouth treated with radiation therapy alone. Int J Radiat Oncol Bioi Phys 1 9 8 1 ;7: 1 005-1 0 1 1 .

12. Pernot M , Malissard L, Hoffstetter S, e t al. The study o f tumoral, radiobiological, and general health factors that influence results and complications in a series of 448 oral tongue carcinomas treated

exclusively by irradiation. Int Radiat Oncol Bioi Phys 1 9 94;29:673-679.

13. Chang DT, Sandow PR, Morris CG, et al. D o pre-irradiation dental extractions reduce the risk of osteoradionecrosis of the mandible ? Head Neck 2007;29:528-5 3 6 .

14. Diaz E M Jr, Holsinger F C , Zuniga E R , et a l . Squamous cell carcinoma of t h e buccal mucosa: o n e institution's experience with 1 1 9 previously untreated patients. Head Neck 2003;25 :267.

15. Mendenhall WM, Morris CG, Amdur RJ, et al. Radiotherapy alone or combined with surgery for adenoid cystic carcinoma of the head and neck. Head Neck 2004;26 : 1 54.

16. Byers RM, Anderson B, Schwarz EA, et al. Treatment of squamous carcinoma of the retromolar trigone. Am Clin Onco.

அரசு ஸ்டான்லி மருத்துவக் கல்லூரி, சென்னை - 600 001.

<u>பங்கு பெறுபவரின் ஒப்பம்</u>

ஆராய்ச்சியின் தலைப்பு :

ஆராய்ச்சி நடைபெறும் இடம் : அரசு ஸ்டான்லி மருத்துவக் கல்லூரி,
சென்னை - 1.

பங்கு பெறுபவரின்
பெயரும் முகவரியும் :

நான், ... இந்த ஆராய்ச்சியின் விவரங்களை எனது சொந்த மொழியில் கூற அறிந்து கொண்டேன்.

இந்த ஆராய்ச்சியின் முழுவிவரங்களையும் நான் அறிந்து கொண்டேன். இந்த ஆராய்ச்சியில் நான் பங்குபெறும் போது எனக்கு ஏற்படும் நன்மை தீமைகளை முழுவதுமாக அறிந்து கொண்டேன்.

இந்த ஆராய்ச்சியின் போது எப்போது வேண்டுமானாலும் நான் விலகிக்கொள்ளலாம் என்பதயும், அதனால் எனக்கு கிடைக்கும் மருத்துவத்தில் எந்தவித மாற்றமோ பாதிப்போ இருக்காது என்றும் அறிவேன். இந்த ஆராய்ச்சியில் நான் பங்குபெறுவதற்காக நான் எந்தவித சன்மானமும் (பணமாகவோ, பொருளாகவோ) வாங்கமாட்டேன். இந்த ஆராய்ச்சியின் முடிவுகளை, என் அடையாளங்களை குறிப்பிடாமல் மருத்துவ இதழ்களில் வெளியிட எனக்கு எந்த ஆட்சேபனையும் இல்லை. இந்த ஆரய்ச்சியில் என் பங்கு என்ன என்பதை அறிவேன். இந்த ஆராய்ச்சிக்கு எனது முழுஒத்துழைப்பையும் தருவேன் என்று உறுதி அளிக்கிறேன்.

பங்கு பெறுபவரின் பெயரும் முகவரியும்:

பங்கு பெறுபவரின் கையொப்பம் / விரல்ரேகை :

தேதி:

ஆராய்ச்சி செய்பவரின் பெயரும் கையொப்பமும் :

NAME	AGE	SEX	IP/RT.NO	TREATMENT	BITING	CHEWING	MOVING FO	SALIVA	SWALLOWI	SUCKING	TASTE	MFO	PV	QS	VFO	EMOTIONS	E&D	BREATHING	ST	SL	Sto	ROM	SOM	SOMOv	STh	SVB	SH&N	SS	PAIN	SPEAKING	DRINKING	EATING	DR	FS	FR	IR	FAMILY	HCP	RLV	MEDICINE	HEALTH IS	RANK
MR.DEVAN	41	MALE	402	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLETE	COMPLETE	NONE	NONE	NONE	NONE	NONE	MILD	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	NONE	COMPLET	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.NEELAMEGAM	49	MALE	686415	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	COMPLETE	COMPLET	COMPLETE	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	COMPLETE	COMPLET	NEITHER	HELP	HELP	HELP	10	10
MRS.GURULAKSHMI	74	FEMALE	422	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	COMPLETE	COMPLET	COMPLETE	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.SEKAR	57	MALE	355	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	COMPLETE	COMPLET	COMPLETE	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MRS.GOVINDAMMA	57	FEMALE	403	RADIOTHERAPY	MILD	MILD	MILD	NONE	NONE	MILD	NONE	MILD	MILD	MILD	MILD	NONE	NONE	NONE	MILD	COMPLETE	NONE	SEVERE	COMPLETE	COMPLETE	NONE	NONE	COMPLET	MODERATE	NONE	MILD	MILD	MILD	NONE	NONE	COMPLETE	MODERAT	HELP	HELP	HELP	HELP	5	9
MR.NEELAKANDAN	53	MALE	1661	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	MILD	MILD	COMPLET	MILD	MILD	COMPLETE	NONE	NONE	NONE	NONE	MILD	SEVERE	SEVERE	SEVERE	NONE	NONE	COMPLETE	NONE	HELP	HELP	HELP	HELP	5	5
MR.MOHAN	50	MALE	415	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	SEVERE	SEVERE	SEVERE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	MILD	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.SELVARAJ	58	MALE	78	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MILD	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.NAGARAJ	50	MALE	191	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	NEITHER	HELP	HELP	HELP	10	10
MRS.NAGAPUSHPAN	67	FEMALE	164	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	NONE	NONE	NONE	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	MODERAT	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.DEVARAJ	53	MALE	184	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	SEVERE	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
KAJAMOIDEEN	45	MALE	168	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	SEVERE	COMPLET	COMPLETE	COMPLETE	COMPLET	COMPLETE	MODERATE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	COMPLET	HELP	HELP	HELP	HELP	10	10
MR.MUNUSAMY	42	MALE	152	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	SEVERE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.MANOHARAN	47	MALE	173	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.JEEVA	37	MALE	136	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.SOUNDER	53	MALE	179	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MRS.LEELAVATHY	50	FEMALE	201	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	SEVERE	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.THANGARAJ	48	MALE	85	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MRS.KANTHAMMAL	70	FEMALE	68	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.SUBRAMANI	45	MALE	43	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MILD	MILD	MILD	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MRS.KALA	57	FEMALE	217	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	COMPLETE	COMPLET	COMPLETE	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.VADIVEL	55	MALE	233	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	NONE	NONE	NONE	MILD	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	MILD	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.SURESH	42	MALE	42	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	MODERAT	MODERAT	MODERATE	MILD	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	MODERAT	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MR.BALAKRISHNAN	67	MALE	67	RADIOTHERAPY	COMPLETE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	COMPLET	COMPLETE	COMPLETE	COMPLET	COMPLETE	NONE	COMPLETE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	COMPLETE	COMPLETE	COMPLET	COMPLETE	COMPLET	NONE	NONE	NONE	HELP	HELP	HELP	HELP	10	10
MRS.KILLAMMAL	50	FEMALE	1648075	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	NONE	MODERAT	NONE	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	8	8
MR.KUNDU	66	MALE	1644714	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MODERAT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	NONE	NONE	NONE	NONE	HELP	HELP	HELP	HELP	9	9
MR.VEERAMUTHU	60	MALE	1623603	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MODERATE	NONE	NONE	NONE	MODERAT	NONE	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	NONE	NONE	MILD	NONE	HELP	HELP	HELP	HELP	9	9
MR.GOVINDARAJ	54	MALE	1617740	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	NONE	NONE	MODERAT	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	NONE	NONE	HELP	HELP	HELP	HELP	9	9
MR.ARUMUGAM	35	MALE	1617634	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MODERATE	NONE	NONE	NONE	MODERAT	MODERAT	NONE	COMPLETE	MODERATE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	9	9
MR.MANOHARAN	47	MALE	1611772	SURGERY	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MODERAT	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MILD	NONE	NONE	NONE	NONE	NONE	NONE	NONE	HELP	HELP	HELP	HELP	5	5
MR.DANIEL	48	MALE	1560011	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MODERATE	NONE	NONE	NONE	MODERAT	MODERAT	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	9	9
MR.VENKATESAN	45	MALE	1554089	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	NONE	MODERAT	NONE	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	HELP	HELP	HELP	HELP	5	5
MRS.ATHIR NISHA	60	FEMALE	1541561	SURGERY	NONE	NONE	MILD	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	NONE	NONE	NONE	MODERAT	NONE	NONE	MODERATE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	HELP	HELP	HELP	HELP	5	5
MR.IBRAHIM	33	MALE	1536953	SURGERY	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MODERATE	NONE	NONE	NONE	MODERAT	NONE	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MODERAT	NONE	HELP	HELP	HELP	HELP	9	9
MR.BALASUNDARAN	53	MALE	1533825	SURGERY	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MODERATE	NONE	NONE	NONE	MODERAT	NONE	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	9	9
MR.JANARTHANAN	43	MALE	1503941	SURGERY	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	MODERATE	NONE	NONE	NONE	MODERAT	MODERAT	NONE	MODERATE	MODERATE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	9	9
MR.GAJENDRAN	55	MALE	1465782	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MODERATE	NONE	NONE	NONE	SEVERE	NONE	NONE	NONE	SEVERE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	9	9
MR.PRABHU	32	MALE	1468918	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	MODERATE	NONE	NONE	NONE	SEVERE	SEVERE	NONE	NONE	SEVERE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	COMPLET	NEITHER	HELP	HELP	HELP	9	9
MR.RAJENDRAN	45	MALE	1460111	SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	NONE	MILD	NONE	NONE	NONE	MODERATE	NONE	NONE	NONE	SEVERE	NONE	NONE	SEVERE	SEVERE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	COMPLET	HELP	HELP	HELP	HELP	9	9
MR.SURYAPRAKASH	42	MALE		SURGERY	MILD	MILD	MILD	MILD	MILD	MILD	MILD	MILD	NONE	NONE	NONE	COMPLETE	MILD	NONE	NONE	SEVERE	NONE	NONE	SEVERE	SEVERE	NONE	NONE	NONE	NONE	MILD	MILD	MILD	MILD	NONE	NONE	SEVERE	NONE	HELP	HELP	HELP	HELP	9	9

KEY TO MASTER CHART

MFO	-	MOUTH FUNCTION OVERALL
PV	-	PRODUCING VOICE
QS	-	QUALITY OF SOIND
VFo	-	VOICE FUNCTION OVERALL
E&D	-	ENERGY AND DRIVE
ST	-	STRUCTURE TEETH
SL	-	STRUCTURE OF LIPS
STo	-	STRUCTURE OF TONGUE
ROM	-	ROOF OF MOUTH
SOM	-	STRUCTURE OF OTHER PARTS OF MOUTH
SOMOV	-	STRUCTURE OF MOUTH OVERALL
STh	-	SYRUCTURE OF THROAT
SVB	-	STRUCTURE OF VOICE BOX
SH&N	-	STRUCTURE OF HEAD AND NECK
SS	-	STRUCTURE OF SHOULDER
DR	-	DAILY ROUTINE
FS	-	FINANCIAL SUPPORT
FR	-	FAMILY RELATIONSHIP
IR	-	INTIMATE RELATIONSHIP
HCP	-	HEALTH CARE PROFESSIONALS
FLV	-	FOOD, LIQUID, VITAMINS